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ABSTRACT

A framework for conceptualizing young children's theoretical and task-related strategies in everyday situations is presented in this Head Start final report. The first section of the report discusses the concept of strategies, reviews relevant literature, and presents a theoretical model of the organization of strategic behavior. The second section describes the Children's Strategies Assessment System (CSAS), a tool for assessing young children's competence in social interactions and in material tasks. The CSAS is largely based on Bronson's (1974, 1982) concept of "executive skill" and on her classroom observation measure, the Executive Skill Profile for Preschool and Primary School Children. The CSAS also extends the social and mastery strategies of Bronson's work, integrating these within a unifying theoretical base and including strategies which have negative as well as positive effects. In the third section of the report, a brief account is given of the evolution of the Animal Stalls task (AST) in its first, second, and current versions. The AST is a block construction task, utilizing familiar materials and an unfamiliar problem, which can be adapted to different ages. In the fourth section, the analysis of pilot test data gathered from over 100 children is presented and discussed, and directions for future research are specified. Related materials, including a copy of the CSAS, are appended. (RH)

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Final Report

THE DEVELOPMENT OF MEASURES OF CHILDREN'S INTERPERSONAL AND TASK STRATEGIES:

ANIMAL STALLS
and
CHILDREN'S STRATEGIES ASSESSMENT SYSTEM (CSAS)

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Foreword and Acknowledgements

In 1981, Bank Street College contracted with the Administration for Children, Youth, and Families to develop new measures for a national evaluation of the Head Start program. Our goal in this project was to develop measures of children's strategies in social interactions and material tasks. The work reported here has taken place over a period of eighteen months, from February, 1981 through July, 1982, with funds originally planned to cover eleven months. In the past seven months, in spite of greatly reduced resources, our effort has been to conclude our work with the highest possible yield, a goal we believe has been achieved. We have developed a structured task, Animal Stalls, and an observation system, Children's Strategic Assessment System (CSAS) for use with children from three through six in the natural classroom setting and in prestructured situations.

These products are the result of the work of many individuals and groups. First, we wish to acknowledge the participation of the staffs, parents, and children of Head Start centers, and public and private schools in New York City, New York State, and Brookline, Massachusetts. We are deeply grateful for the generous access they gave us to their programs and appreciate the penetrating and careful questions they asked about our work. We do not mention them by name in order to maintain confidentiality.

We acknowledge, with gratitude, the work of our advisory panel, whose members had a high opinion of the project's goals and gave us good, concrete advice, criticism, and encouragement. Among panel members, we would like especially to thank Dr. Virginia Shipman and Dr. Margaret Spencer who worked intensively with us and gave us invaluable help in developing some observation categories and in considering types of tasks; and Dr. David Forbes for his individual advice. Very special acknowledgement must be made of Dr. Martha Bronson's work. Her Executive Skill Profile has provided the basis for our observation system, which we have developed in collaboration with her. Dr. Bronson tested the CSAS in the structured task and in the classroom, with a small group of children, and analyzed the data from that substudy. Her energy and enthusiasm have been a great asset to the project.

Other members of the advisory panel who gave us the benefit of their experience, advised us wisely, and greatly facilitated our contacts with Head Start centers and schools are Ms. Mariam Bedolla, Ms. Videlia Navarro, Ms. Shelley Price, Mrs. Betty Smith, and Mrs. Judy Victor.

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We greatly appreciate the intelligent and good humored contributions of the staff at Abt Associates, our subcontractor: Dr. Barbara Dillon Goodson worked with us on conceptualizing children's strategies, and, in the final phase of the project, was a consultant to us in the development of the Animal Stalls task and, together with Dr. Bronson, collected the data for the substudy. Ms. Judith D. Singer provided the original sampling design, statistical advice, and contributed to our conceptual discussions.

This report is one of the products of a larger team effort and acknowledgement is due to the Bank Street College project staff: Edna Shapiro, Lucia Desir, Lenora Fulani, Margarita Perez, Gloria Strickland, Virginia Mason, and Nancy Cook. Edna Shapiro has had senior responsibility in all phases of the project, including the writing of this report. Lucia Desir has done the bulk of the data gathering, has been our Spanish speaking liaison and interviewer and contributed to the development of the measures and to literature reviews and project reports. Lenora Fulani helped with early conceptualizations, literature reviews, report writing, and task development. Margarita Perez observed children and joined in the first discussions. Gloria Strickland helped us in our contacts with Head Start centers and schools. Virginia Mason handled all arrangements for our first panel meeting and was our project secretary for the first few months. Nancy Cook has had this role in the final phase of the project and has typed this report, which Ruth Kolbe and Patty O'Brien also helped to produce.

We are most grateful to Richard R. Ruopp, President of Bank Street College, whose unswerving support has been an important resource to us and to the project.

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Doris B. Wallace
Project Director
Bank Street College
Research Division
August 1982

A B S T R A C T

CONCEPTUALIZING AND ASSESSING CHILDREN'S STRATEGIES
IN SOCIAL INTERACTIONS AND TASKS

A theoretical framework is presented for conceptualizing young children's social and task-related strategies in everyday situations. Five central constructs have been used from which behavioral indicators are derived:

Involvement--the child's absorption in an activity;

Planning--how the child organizes and anticipates his/her actions and those of others;

Monitoring--checking and commenting on one's work and that of others;

Accommodating--the child's adaptation to the demands of the social and material situation;

Outcome--the completion, success and evaluation of an activity.

Findings are presented from pilot studies of an observation system (CSAS) focused on strategy use, and a structured task (Animal Stalls) designed to elicit strategies.

In the structured task, the nature of children's involvement and the kind and frequency of the strategies they use are systematically related to adequacy of outcome. The most competent children are the most involved. A greater incidence of Planning and Monitoring strategies is definitively associated with more competent performance. Children's Planning and Monitoring strategies were predominantly positive. Accommodating strategies occurred primarily in classroom social interactions and included negative as well as positive strategies. Teachers' ratings of children's competence is strongly associated with greater competence in the structured task, and with more successful and more frequent use of positive strategies.

The association of particular strategies with developmental level, as well as the differential use of strategies in different contexts is discussed. The findings show that the conceptualization and measures developed provide a coherent approach for measuring aspects of young children's competence.

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I. CONCEPTUAL FRAMEWORK AND THEORETICAL MODEL

Introduction

This is the final report of a project that was part of an effort to develop measures of the effectiveness of Head Start programs. The goal has been to construct measures that would be both more comprehensive and more appropriate than those that have been used in the past. Previous large scale efforts to assess the impact of Head Start programs have relied heavily, often exclusively, on IQ and achievement scores and they have been severely criticized for this since the goals of Head Start are far broader than to develop the specific abilities measured by IQ and achievement tests. In this project four domains of functioning were identified for which measures were to be developed: health and physical status, cognitive functioning, social-emotional development, and applied strategies. These are conceived as an interrelated hierarchy in which the domain of children's strategies is of a higher order, integrating and organizing the behaviors in the other domains. It is the development of measures of children's strategies that has been the focus of our work.

Our work has proceeded along three broad lines:

1. Theoretical Model. For conceptual clarification and to provide a theoretical framework, we developed hypothetical constructs to represent a model of strategic behavior. From these constructs, a series of behavioral indicators was generated. The model has been informed by relevant literature in child development and research in children's strategies. The notion of social competence and its central position in the ideology of Head Start was also taken into account.

2. Observation System. We have developed the Children's Strategies Assessment System (CSAS) for use in the natural preschool and primary school classroom and in prestructured tasks. This system is an extension

of Bronson's Executive Skill Profile (1975, 1978, 1980, 1982).

3. Construction Task. We have developed a special task--Animal Stalls--for children aged three through six. Animal Stalls provides the opportunity to observe young children's strategies in a prestructured situation.

The remainder of this document describes our work in the above three tasks. In this section, we discuss our concept of strategies, review relevant literature and present our theoretical model. This is followed, in Section II, by a description of the Children's Strategies Assessment System (CSAS). We then give a brief account of the evolution of the Animal Stalls task in its first, second, and current versions (Section III). The analysis of data gathered from over 100 children is presented and discussed in Section IV. Finally, we consider the future direction of our work.

Strategies and Competence

The concept of strategies highlights the child's ability to draw on his or her knowledge and capabilities and to use them in specific situations. Strategies are used by children in everyday, specific situations to organize knowledge and action. A strategy is a means to some end, the manifestation, in action, of an instrumental intent. It is therefore purposeful and, to be effective, fits the situation. Our broad definition of children's strategies is as follows:

> A child's ability to organize his or her own cognitive, social, emotional and physical capabilities in purposeful, adaptive interaction with other people and material objects in specific situations.

The concept of strategies has roots in the idea of social competence. Zigler (1970, 1973) was one of the first to point to the notion of social competence as pertinent to measuring the effects of Head Start programs.

He contrasted the "training of intellect" with the "development of the child" and suggested that the latter was a more appropriate expression of the goals of Head Start. Social competence, however, while a central goal of Head Start, has eluded easy definition (cf. Anderson & Messick, 1974; Raizen & Bobrow, 1974). It has been assessed in several different ways (see O'Malley, 1977); by observational methods (e.g., Ogilvie & Shapiro, 1973; White & Watts, 1973); by analysis of personality structure (e.g. Kohn & Rosman, 1972a, 1972b); and in terms of social interaction theory (e.g., Weinstein, 1969). The last approach is closest to the concept of strategies, at least in the social domain. Weinstein speaks of the individual as organizing "lines of action" in the pursuit of "interpersonal tasks."

Zigler and Trickett (1978) reconceptualized social competence from the point of view of its relevance to Head Start goals; they suggest that an index of social competence should include measures of physical health and well-being, a measure of formal cognitive ability, an achievement measure, and measures of motivational and emotional variables. They also see that this "tentative competence index...is hopelessly infused with values that are far from universal" (p. 796). Like the concept of adaptation, social competence implies active coping with and succeeding in the environment with a premium on socialization.

Lee (1979) has put forth an alternative definition of social competence, suggesting that is "the translation of [the individual's] capabilities into functionally appropriate interpersonal strategies for use in particular situational and/or sociocultural contexts...It is knowing how to use one's existent knowledge. Social competence is, therefore, the ability to draw on one's capabilities and social knowledge and combine

them for lines of action or strategies in functionally appropriate ways" (p. 795). Lee proposes that social competence can be measured by a person's "repertoire range and levels of complex strategies for dealing with a social environment." The idea of repertoire range and of looking not only at strategies qua strategies but of assessing the level and complexity of the strategy(ies) the individual enacts places the construct in a developmental framework. (In an allied area, Werner [1948] has taken it as a principle that the more mature individual can use a broader range of different operations in more modalities and with greater flexibility.) Lee argues that a repertoire approach makes it possible to take account of cultural variations, and offers a way of treating qualitatively different repertoires within the same framework. She sees strategies as an alternative formulation of social competence.

Bronson's (1975, 1981, 1982) concept of executive skills is also an expression of the idea of competence, inferred from children's behavior in their classrooms. Executive skills are considered to include both social and nonsocial behavior and, like strategies, are integrative; they are manifestations of the child's competence in dealing with the realms of people and objects.

Strategies concern not just what a child knows in an absolute sense but how he or she applies that knowledge in action. In many other measurement efforts, the child's knowledge itself is being elicited or inferred. Strategies are concerned with the application of knowledge.

The concept of strategies provides a useful and interesting way of thinking about and measuring important dimensions of children's behavior. It should be emphasized, nevertheless, that there is as yet no clearly defined body of relevant research, nor a worked out conceptualization of

what strategic behavior means. In order to have a justifiable way of measuring children's strategies, it was important to clarify the concept and define the relevant constructs.

Relevant Psychological Concepts

Competence is a concept of broad scope, anchored in behavior. As Connolly and Bruner (1973) put it:

> ...When we talk about competence we are talking about intelligence in the broadest sense, operative intelligence, knowing how rather than simply knowing that. For competence implies action, changing the environment as well as adapting to the environment (p. 3).

The idea that children apply identifiable strategies in their everyday behavior is based on the assumption that the child is an active, purposeful organism with a human need to know. The environment of such an organism is not conceived as something that "happens" to it (Piaget, 1952). Rather, the child seeks out those features of the environment to which he can meaningfully respond (cf. Gruber & Vonèche, 1977). The concept that human growth and development is in large part a function of the organism's increasingly complex interaction with the world is highly congruent with the notion of applying strategies. A strategy, when put into action, is an intervening process between an intention on the part of the actor and a reaction on the part of the environment (an object or person). And Piaget was not the only scientist to emphasize that children learn by observing the consequences of their own actions. The two fundamental invariant processes of organization and adaptation in Piaget's theory are also relevant: "It is by adapting to things that thought organizes itself and it is by organizing itself that it structures things" (Piaget, 1952, p. 8).

A second principle that has guided our work derives from Robert White's (1959, 1960) conceptualization of the human being as intrinsically motivated to make an impact on the environment, to be competent in the world. This means acting effectively to master one's environment in ways that are sanctioned by one's immediate and larger social group. Harter's (1978, 1982) work elaborates on White's conceptions of intrinsic motivation by exploring the developmental course of motives; and raising questions as to how motivational hierarchies interact with age. She also extends White's model of effectance motivation to deal with unsuccessful as well as successful mastery attempts, pointing out that a model of competence must also elucidate the possible effects of less competent behaviors. The importance of intrinsic motivation has also been emphasized by a number of other writers (see, for example, Deci, 1975; J. Hunt, 1971). Goodwin (1980) reviews this literature, noting its relevance to the concept of competence.

A third concept germane to children's strategies is that of an independent sense of self. Spencer (1981) has emphasized that interpersonal competence is related to decentration (the capacity to decenter from the self and be able to take the position of another person). She takes note of Mead's early statements concerning the child's ability to see him or herself as both subject and object. It is generally accepted that a differentiated sense of self is a prerequisite for a differentiated perception of objects and other people (cf. Shapiro & Biber, 1972).

This leads to a fourth concept that has guided our work, that development in general is characterized by increasing differentiation--of perception, thought, feeling and action (cf. Werner, 1948). The child's ability to differentiate the characteristics of people, objects, and

situations and to make the relevant adaptations increases significantly during the preschool and early school years. There is also a concomitant increase in the sheer number of possible behaviors in the child's repertoire.

Language development also plays an important role in the conceptualization of the development of strategies. By this we do not mean increase in vocabulary or correctness of grammatical usage, but the use of language as a tool for thought. As Vygotsky (1978) has said, "...speech not only facilitates the child's effective manipulation of objects but also controls the child's own behavior" (p. 26). He speaks also of "the planning function of speech," another sense in which language development is pertinent to strategic behavior.

In the context of the preschool and primary school, where children undergo important socialization processes, Clauson's (1968) outline of the socialization tasks that confront children is highly relevant. Among these are the need to develop a cognitive map of one's social world in order to learn to fit behavior to situational demands; learning to take the perspective of another person and thus be able to respond selectively to the expectations of others; developing a sense of right and wrong and goals and criteria for making choices; and achieving a measure of self regulation and criteria for evaluating one's own performance in the interests of becoming independent and self directed. These achievements or competencies are developmentally geared and are preceded by the more basic socialization tasks of language development, learning to walk, to feed and dress oneself, and so on. Clauson's formulation clearly involves social and emotional as well as cognitive functions and leaves room, as well, for the transmission of cultural goals and values.

In sum, from these concepts the child is seen as: active, interacting with an environment of material objects and people; a person whose behavior is organized and adaptive; who is intrinsically motivated to have an effective impact on the world; who has an independent sense of self and an increasing ability to differentiate objects and people; and for whom the development of language has control and planning, as well as communicative functions.

In our effort to specify the concept of strategies in a more fine-grained way, information processing theory has provided a useful formulation. The concept of human information processing, which now pervades thinking about cognition. draws a parallel between human cognition and computer processing. The information processing approach has conceived of the human mind as a "system," like a computer. Research has been concerned with tracing the flow of information through this sytem, and cognition is described in terms like input, processing, subroutine, feedback, and the like. Further, in an information processing approach, cognition or knowing is considered to be largely "knowing how": there is an emphasis on process rather than information. Humans are considered to control their behavior, including the internal behavior of thinking, by strategies or programs that are stored as long-term memory, and that are modifiable (Simon, 1972). In this sense, therefore, cognitive development can be considered in large part to be a change in the strategies (or programs, or schemata) that the child carries around.

The specification of information processing models has ranged from the relatively general description of processing strategies, as in Miller, Galanter and Pribram's (1960) well known TOTE model, to fine-grained

representations, for example, processing programs that simulate a child's behavior in a task, such as a standard Piagetian class inclusion task (Klahr & Wallace, 1972).

Miller, Galanter and Pribram's work has been especially influential in the field of cognitive psychology and in our work. In their model of the mental processes involved in organized, goal-directed behavior, the human processor is conceived as constructing internal plans for action, which guide action and against which the results of the action are compared. The model is iterative in that the consequences of an action modify the internal plan, which then guides the next step in the action, and so on.

There are three crucial aspects of this model that make it seminal and that have appeared in most other information processing models developed since then. First, the model emphasizes the active role of the processor. Internal mental processes are conceived as actions: constructing a plan, testing out the plan, comparing the observed consequences of the action to the anticipated consequences. Second, these internal plans are seen as crucial for organized behavior. This emphasis on plans and the planfulness of behavior puts the processor's intentions and knowledge in a central role. Something similar to "plans" appears in most other models, although often labeled differently (e.g., schemata, representation). The iterative nature of the model is its third crucial aspect. As described above, the model "loops back" on itself, indicating a cyclical rather than a linear process.

In many respects information processing models provide a general approach for studying children's strategies, and a beginning specification of some of the mental processes likely to be involved in complex behavior. However, simple information processing models are inadequate

in ways that are relevant to our purposes. These inadequacies have been eloquently detailed by Neisser (1976). The models are, in general, too restricted in scope, and not sufficiently connected to the real world. They are primarily or exclusively concerned with internal mental processes. They usually lack ecological validity, ignore culture, and miss some of the main features of cognitive operations as they occur in ordinary life. These omitted features are important aspects of our efforts to develop a model of children's strategies.

Neisser himself has recommended a number of changes in an information processing approach. First, he calls for greater efforts to "understand cognition as it occurs in the ordinary environment and in the context of natural purposeful activity" (p. 4). Second, he is concerned with examining and analyzing "the environment the mind has been shaped to meet." We must pay attention to the details of the real world, and the structure of information the world makes available to the perceivers and thinkers in it. Third, he points out that any model or theory must be able to account for the actual sophistication and complexity of cognitive skills that people can acquire, and for the fact that these skills undergo systematic development. Finally, Neisser emphasizes that a satisfactory theory of human cognition "can hardly be established by experiments that provide inexperienced subjects with brief opportunities to perform novel and meaningless tasks" (p. 8). We have tried to give full recognition to Neisser's caveats.

Research on Children's Strategies

A brief review of research on strategy development highlights important issues in the study of strategies, and also the importance of studying strategic behavior. Simon (1972) states: "A large part of all

the changes that take place in a child's intellective process during his development appears to be describable as change in the strategies or programs he carries around with him" (p. 17).

In recent years, the concept of strategies has received a good deal of attention in the research literature though different researchers use different labels. For example, metacognitive skills have a good deal in common with what we call strategies (see for example, Flavell, 1970, 1979). Brown and DeLoache (1978) refer to metacognitive or self-regulatory skills as "processes by which people organize their thoughts and actions including activities such as: planning ahead, predicting the outcome of some action (what will happen if?), monitoring ongoing activity (how am I doing?), checking on the results of actions (did that work, did it achieve my goal?), correcting errors or inadequacies" (p. 14). Such processes are clearly part of the domain of strategies.

Vurpillot (1968) studied visual scanning strategies, observing the eye movements of children agred three through nine, who were asked whether two visual arrays were the same or different. Vurpillot's work shows a developmental sequence in which both the criteria for what children search for and the way they search undergo change and development. Certain strategies, which can make a difference to effective performance, often occur on microscopic levels and change over time.

Mnemonic strategies have perhaps received the most attention in the literature. Flavell (1970) has shown that the main difference between young children and effective memorizers is that the older and more effective memorizers tend to use a variety of strategies. Brown's work also points to the importance of knowing when to use which strategy. Hagen and Kingsley (1968) demonstrate that some strategies used by younger

children are discarded by older children as less effective. Thus, developmental change does not simply mean adding on more strategies, but selective use of a more varied repetoire.

Istomina's (1975) study of mnemonic strategies contrasted memorizing in a standard list-learning situation with memorizing in the context of a meaningful activity. Her study provides information both about developmental change and the interaction of strategy use and context. Younger children in the naturalistic setting appear to be spontaneously discovering the use of rehearsal strategies. Older children in both settings show an awareness of strategy use as a source of control over their memorizing, and also display more sophisticated strategies.

Another set of studies has examined children's construction strategies with various materials--blocks, nesting cups, wooden puzzles, felt boards, mobiles, etc.--(Greenfield, Nelson & Saltzman, 1972; Goodson & Greenfield, 1975; Goodson, 1982; Forman, Laughlin & Sweeney, 1971; Forman, 1982). Strategies have been defined, for example, in terms of the different order of placement children use in construction. This work, like some of the research on memory and visual scanning, emphasizes the kinds of knowledge as well as the variety of routines and subroutines that children have to master in order to function effectively in apparently simple tasks.

Quite different from the studies mentioned above is a set of studies of aspects of children's social cognition that examines, for example, children's strategies for entering a peer group (e.g. Putallaz & Gottman, 1981; Forbes & Lubin, 1979, 1981). Structured observations of children entering or attempting to enter a group have led to the identification of a range of strategies, such as "giving information," "expressing feelings," "expressing agreement." Forbes and Lubin have studied the kinds of per-

suasive techniques that children spontaneously use in a free play situation. Children are also asked: "What would you do if..." or "How could you..." Ann, aged five, shows her command of a set of strategies when she suggests various ways one could get a playmate to let her have a desirable doll: "You could ask her for the doll...You could ask her to have it after...You could say, 'Please, I promise to give it back'... You could give her another doll...You could say, 'If you give it to me, I'll buy her some new clothes."

Bronson's observational system for codifying children's executive skills has been especially valuable to us because it deals with children's social and "nonsocial" or "mastery" (in tasks) behavior (1978, 1981, 1982). The system is designed for use in the classroom, and focuses on social behavior, mastery behavior and the child's use of time. The Executive Skill Profile has been used with several hundred children, aged two to seven, in a wide variety of school settings. As is evident in Section II, Bronson's concepts and observational categories have served as the basis for the observation system used in the present study of strategies.

This brief review raises several conceptual and methological issues. In the research cited here, specific observable strategies were distinguished, largely tied to particular tasks or contexts of interest--visual scanning, memory, construction, or certain aspects of peer relationships. Researchers have asked what the strategies are that children of different ages use in effective manipulation of a particular task or situation. For the most part, the tasks used predetermine the strategies that can be observed. The definition of a particular strategy, how it develops, and how it is used will vary depending on the task; and any given task or situation offers particular opportunities for the child to manifest certain kinds of strategies.

Another issue has to do with the role of ontogenetic change in the development of strategies. Past research makes it clear that it is important to study strategies in a developmental framework. It is by observing children of various ages that Vurpillot (1968) was able to understand how strategies change with development. It is clear that development interacts with strategy use (e.g. Hagen, 1972; Istomina, 1975). Further, some strategies that are intentional for a young child will become routine for an older child and as children grow older, they discard less effective strategies for more effective ones. It is important to note, however, that developmental sequences have been mapped only as general trends. We do not have clear developmental markers that can be used to assess children's "status," or that apply across tasks.

Organization of Strategic Behavior: Theoretical Model

In formulating the theoretical model of strategic behavior, we have drawn on the relevant literature, both the general theoretical work and the more specific studies of strategies. We have found the information-processing approach to be especially helpful in our effort to specify more precisely what is implied by the concept of strategic behavior in activities with objects and other people. The schematization presented in Figure 1 is a formalized and highly abstract definition of the organization of strategic behavior. The figure shows the structure and sequence of the psychological events hypothesized, and the major constructs from which specific observable behaviors have been derived. Figure 1 does not take account of the individual's physical and developmental status, nor of the particular context in which behavior occurs.

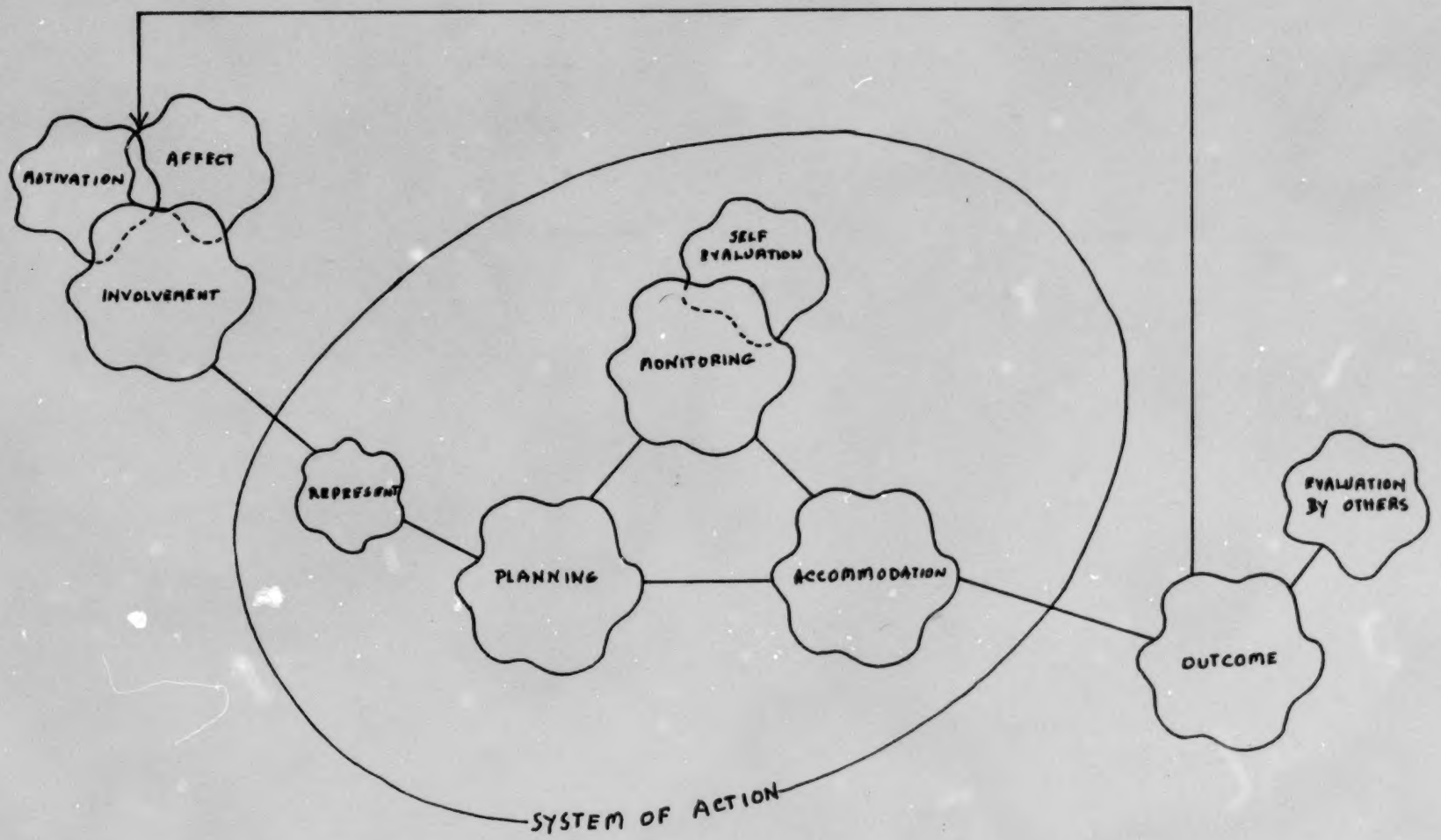

Figure 1. The Organization of Strategic Behavior

As can be seen, Planning, Monitoring and Accommodation are processes with associated actions that form a recursive subsystem of action within the schema. This subsystem also includes other processes which may be entirely or partly internal. Involvement and Outcome are represented as outside the system of action, the first being a state of being and the second an event. Each construct is briefly defined and described below.

Involvement

Involvement is a function of the motivation and affect (the needs, desire and impulses) that lead to action. It is a state of being and is therefore outside the system of action in Figure 1.

Strategies are part and parcel of purposeful activity and the child in such activity is, by definition, motivated and involved. Whether a task is self-imposed or suggested by others (e.g. another child, the teacher, the interviewer) the child's involvement is always in part generated from within.

Involvement is often contrasted with aimless or unfocused behavior in observations of young children in school or preschool settings. This is not surprising since early education largely consists of the pursuit of purposeful activity. The child's capacity to become involved in such activity is encouraged from preschool on.

Planning

To plan means to look ahead, to work out what is needed and what to do next in connection with some activity. It is assumed that planning, however rapid, is a prerequisite to action, and that some planning behavior is overt. Planning is also a form of organization; it organizes purpose and behavior. It may be directly observable, as when a child

verbalizes a plan, or it may be inferred from the organization of actions (e.g., when a child prepares a space for an activity).

The representation of the activity is hypothesized as a necessary process that precedes purposeful action. It is internal and, therefore, not observable, although it is often possible to infer the way in individual construes a task from the way he or she acts. How an activity is represented influences how action is organized, and representation is depicted as preceding planning.

Monitoring

Monitoring is the self-regulating of one's actions in an activity or task in terms of a plan or goal, that is, comparing and evaluating the outcome of action with the expectation or goal of the activity. Monitoring is hypothesized as continuous and may be voluntary or involuntary. This process suggests awareness of the impact of one's actions on other people and on physical objects--a capacity that is actively encouraged in preschool and primary school.

Self-evaluation is the positive or negative assessment of the outcome of one's own behavior. It is the evaluative aspect of monitoring one's own actions and overlaps with it.

Accommodation

This is the construct that most directly brings the idea of adaptation into the schema and concerns behavior in response to the actions of others or to one's own actions. It does not imply passivity, but rather the ability to adapt to the demands of the physical and social situation, and to changes in those demands. It includes the give and take necessary for competent activity in the real world of objects and people.

Outcome

Outcome, like Involvement, is outside the system of action because it is an event in the external world, not a process. In the course of any activity, there are innumerable small outcomes. Outcome in Figure 1 refers to the end point of a sequence of behavior, i.e. the completion and success of an activity. One aspect of Outcome is evaluation of one's actions by others. Evaluation both by peers and by teachers contributes significantly to the young child's definition of success and mastery, or failure and ineptitude. The Outcome of action is linked to motivation and thence to Involvement as the feedback mechanism in the schema.

A hypothetical model, such as the one described above, has a seductive quality of apparent veridicality, as if the world is really like that. We must remind ourselves, therefore, that the model is merely a series of abstractions. At the same time, we have found this model extremely useful for generating and integrating children's concrete behavior in a coherent theoretical framework. The behavioral indicators derived from the hypothetical constructs in the model are presented in the next section. They are the observable strategies in the Children's Strategies Assessment System (CSAS).

II. CHILDREN'S STRATEGIES ASSESSMENT SYSTEM (CSAS)

The Children's Strategies Assessment System (CSAS) is a tool to assess young children's competence in social interactions and in material tasks. The focus is on the strategies children use in these two domains, that is, how they organize their behavior in purposeful activities with others and with objects.

The CSAS is largely based on Bronson's concept of "executive skill" and on her classroom observation measure, the Executive Skill Profile for Preschool and Primary School Children (1974, 1982). The CSAS extends the Social and Mastery strategies of Bronson's work, integrates these within a unifying theoretical base and includes strategies which have a negative as well as positive aspect.

The system is for use with children aged three through six, both in the natural setting of the preschool and primary school classroom, as well as in a structured situation where a child is given a specially designed task (or standard measure) in an individual session, or where two or three children are asked to collaborate in a task. The procedures and categories of the CSAS are described in detail in Appendix A. In this section, only the main elements are presented.[1]

Constructs and Strategies: Overview

In the CSAS, children's strategies in purposeful social interactions and in goal oriented tasks with objects are grouped in terms of five main theoretical constructs: INVOLVEMENT, PLANNING, MONITORING, ACCOMMODATION, and OUTCOME. These were discussed in theoretical terms in the previous

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[1]Appendix A has been written to be read and used independently of this report. As a result, there is some inevitable overlap between this section and Appendix A.

section. In the CSAS, they are concretized as observable action. The central elements of each construct represented in the CSAS observation categories is briefly described as follows:

Involvement:	The nature of the child's absorption in an activity.
Planning:	How the child manages, organizes, and anticipates his/her actions and those of others.
Monitoring:	Checking and commenting on one's own work and that of others.
Accommodation:	The child's adaptation to the demands of the social and material situation in context.
Outcome:	The completion, success, and evaluation of an activity.

Children's strategies are recorded in different categories under each of these five constructs. Social strategies are differentiated from strategies with objects, or "mastery" activities as Bronson has called them, though an overlap is obviously possible (e.g., two children working on a puzzle).

Social Strategies:	These are the strategies that occur when the child is interacting in purposeful activity with one or more other people.
Mastery Strategies:	These are the strategies a child uses when engaged in a purposeful task with objects. The task may be a solitary activity or one undertaken with one or more others. It is often a problem-solving activity. It always has a known or observable goal whose achievement in terms of completion and success are observable.

The Social and Mastery strategies recorded in the CSAS are presented in Figure 2, grouped according to the five constructs. The figure provides an overview of all strategies. As indicated on the figure, items with an asterisk can have both positive and negative aspects. Where relevant, a record is also made of whether a strategy is accepted, rejected or ignored.

Figure 2. Constructs and Strategies in Social Interactions and Mastery Tasks.

Construct	Strategies	
	Social	Mastery
INVOLVEMENT	Collaborative Interaction Noncollaborative Interaction Socializing	On Task Explores Distracted Attends to Instructions
	Involved Watching Not Involved Other	
PLANNING	*Physical Setup Predicts Outcome Suggests Activity/Demonstrates/ Directs Assigns Roles or Resources Invokes Rules *Request to Join	*Physical Setup Predicts Outcome Verbalizes Rules or Task Requirements *Uses Systematic Approach
MONITORING	Monitors Others *Describes or Comments on Others *Describes or Comments on Self	Checks Instructions or Model Describes or Comments on Work Comments on Ease or Difficulty of Task
ACCOMMODATING	*Shares *Trades or Trades Off *Takes Turns *Promises/Bribes *Helps *Joint Effort or Combines Resources Hostile Force Resists Rules or Teacher Asks Social Help	*Revises Action or Takes New Approach Fine Tunes Asks Mastery Help
OUTCOME		
Completion		Completes Incomplete Not Applicable
Success		All Perfect Nearly Perfect About Half Less than Half Right
Evaluation	Praised Criticized Corrected Ignored	

*Strategies with an asterisk have both positive and negative aspects.

In a few instances, Social and Mastery strategies are identical, e.g. Physical Setup, under PLANNING. In a few others, they are parallel, e.g. Invokes Rules (Social PLANNING) and Verbalizes Rules or Task Requirements (Mastery PLANNING). By and large, however, Social strategies and Mastery strategies, while not mutually exclusive, are different, reflecting the different behavioral demands and conventions in these two activity domains in the everyday life of preschool and school.

The CSAS provides both a time and event sample of the behaviors recorded. Time is recorded in 15-second intervals. The technical details of the recording and coding procedures, as well as detailed definitions with examples can, as noted, be found in Appendix A. In the remaining pages of this section, we present only brief descriptions of the strategies in the CSAS. We describe, first, the categories of INVOLVEMENT for Social and Mastery activities. We then present all the Social interaction strategies (grouped according to whether they are PLANNING, MONITORING or ACCOMMODATING strategies). This is followed by brief descriptions of all Mastery strategies, again presented according to whether they are Mastery PLANNING, MONITORING or ACCOMMODATING strategies. Finally, OUTCOME categories are described. The reader may find it useful to refer to Figure 2 to keep track.

Social and Mastery Involvement

Social and Mastery INVOLVEMENT indicate the child's capacity to be absorbed in purposeful activity with others and with material objects. The categories show the type and level of these activities, as well as the amount of time the child spends in nonpurposeful activity.

There are three Social Involvement categories: Collaborative Interaction, where the child is clearly engaged in organized cooperative play; Noncollaborative Interaction, when the child is interacting with others in associative or parallel play; and Socializing, when the child is exchanging information or comments with another child or adult.

The Mastery Involvement categories indicate whether the child is On Task, that is, focused on a Mastery task with a clearly discernible goal; Explores, i.e., involved with some aspect of the physical environment but without a clearly discernible goal; Distracted from a Mastery (On Task) focus; or Attends to Instructions being given for some activity.

Other Involvement categories include Involved Watching, when the child is watching a social or mastery activity in an intent, focused way for more than a few seconds; Not Involved, when the child is wandering aimlessly, or drifting, or simply not apparently doing anything; and Other when the child is involved in activities such as standing on line or riding a tricycle.

Social Strategies

Social strategies consist of PLANNING, MONITORING and ACCOMMODATION strategies. First we describe strategies categorized under PLANNING. Two of these have negative aspects (indicated by an asterisk).

Social Planning Strategies. The first of these is *Physical Setup, which is a preparatory strategy, the physical organization of materials or a play space before or during a social interaction. The negative of this strategy is a lack or inadequacy of preparation that is detrimental to the interaction. Predicts Outcome is recorded when the child makes a verbal prediction about the social activity. Suggests/Demonstrates/Gives Directions is self-explanatory, but the suggestions, demonstrations or

directions are themselves organized and are Social strategies to organize others. They are not just unrelated demands for others to obey, but indicate the presence of a plan. Assigns Roles or Resources is recorded when the child assigns roles, parts, teams, or material resources in role play or other games. Invokes Rules means an appeal to rules to facilitate social interaction, stating the rules of a game, or invoking the rules of the classroom or school in order to organize the activity. *Request to Join is recorded when the child makes a bid to join one or more other children in an activity. The negative of this strategy is a refusal to let others join in an activity.

Social Monitoring Strategies. There are three Social Monitoring strategies: Monitoring Others, when the child is watching or checking the actions of others in the interaction; *Describes or Comments on Others, when the child takes verbal note (positively or negatively) of another person's actions, feelings, or appearance; and *Describes or Comments on Self, when the child verbally notes his own actions, feelings, or appearance in a positive or negative way in relation to a social situation. Negative self-monitoring implies negative self-evaluation ("I'm so bad at this game"), rather than a statement of negative feeling ("I am sad").

Social Accommodating Strategies. The largest number of Social strategies are ones involving accommodation and reflect the importance of socialization in preschool and school, where children are being inducted into the rules and customs of group life and learning. Coping with constraints and limits, and learning to control impulses is a pervasive task for the young child.

*Shares, *Trades/Trades Off, *Takes Turns, *Promises/Bribes, *Helps, *Joint Effort/Combines Resources are strategies that call up familiar

situations, each with its positive and negative aspect. The positive side of these strategies is when the child suggests sharing, taking turns, etc., or when the child agrees to a request from someone else to do so. Negative use of these strategies is a refusal to take turns, trade, or help. In *Promises/Bribes, it means a threat ("I won't be your friend if you don't..."). Hostile Force and Resists Rules or Teacher are always negative strategies. Hostile Force is a resort to physical or verbal abuse (hitting, biting, insulting) as a way of attaining social goals or solving social interaction problems. Resists Rules or Teacher is a lack of accommodation to the physical and social constraints of the setting. Asking Social Help is an appeal to another child or the teacher to solve a problem in a social situation.

Mastery Strategies

As can be seen from the list of constructs and strategies in Figure 2, there are fewer Mastery than Social strategies in the CSAS, primarily because of the large number of Social Accommodation strategies.

Mastery Planning Strategies. There are four Mastery Planning strategies. The first, *Physical Setup, is recorded when the child gives evidence of foreseeing the requirements of a task by preparing space for the activity, gathering together relevant materials before beginning the task, or by organizing materials while doing the task (such as grouping things or turning puzzle pieces over). The negative aspect of this task is the failure to gather or organize materials in a task that requires this strategy, or gathering inappropriate materials. Predicts Outcome means that a child makes a verbal prediction about, or states a plan for a Mastery activity. Verbalizes Rules or Task Requirements refers to the

child's verbal indication of what is required in a prospective or on-going task. The child may repeat instructions to her/himself, state a hypothesis about how to do the task, or verbalize general or specific rules that apply to a task. The last Mastery Planning strategy is *Uses Systematic Approach. This is recorded when the child gives evidence of the operation of a plan or hypothesis by proceeding in a systematic and ordered way or with a clear notion about what to do next and how to do it. The negative side of this strategy is when the child seems to have no clear ideas about how to proceed and uses a trial and error method in a haphazard way.

Mastery Monitoring Strategies. The three Mastery Monitoring strategies are: Checks Instructions or Model, when the child checks (looks back at, searches, notices) his/her progress against expectations, plans, or against a model provided (such as in Animal Stalls); Describes or Comments on Work, when the child verbally notices features of the task or remarks on the progress of the task; and Comments on the Ease or Difficulty of a Task, when a child indicates his/her perception of how easy or difficult the task will be or was for him/her.

Mastery Accommodation Strategies. There are three mastery accommodation strategies: *Revises Action or Takes New Approach is recorded when the child corrects errors or changes his/her approach when something has not worked out. The negative of this strategy is entered when the child's revision is less effective or a change is made from a correct action or approach to an incorrect one. Fine Tunes refers to the child's careful adjustment of some part of a task (aligning blocks, erasing and rewriting more neatly). Asks Mastery Help refers to the child's request for help in a mastery task from a child or teacher.

Outcome

Outcome consists of three parts: whether the activity was completed, whether its outcome was successful, and (if applicable) how it was evaluated by others. These events are briefly described below.

Success Categories. The Success categories are: All Perfect, when the completed task is without errors; Nearly Perfect, when the child has done most of the task correctly and has clearly understood it; About Half Right, which is any degree of correctness between Nearly Perfect and Less Than Half Right; and Less Than Half Right, when more than half the parts of the task are incorrect.

Completion Categories. The task is judged as Complete when the child clearly does all parts of a task (whether successfully or not); as Incomplete when not all parts of the tasks are completed; as Not Applicable when the observer cannot determine whether the child has completed the task. For the Animal Stalls task, a Completion-Success Index is also calculated (see Appendix A).

In the natural classroom setting, if observation is ended before a child has finished a task, Complete is entered if the child has been working steadily, and an Incomplete when the child has very often been distracted.

Evaluation Categories. This is entered whenever the child is Praised, Criticized, Corrected or Ignored in a Social or Mastery activity, and whether by another child or a teacher.

* * * *

In the course of this project, the CSAS has been developed in conjunction with the development of Animal Stalls, after intensive preliminary classroom observations. It had originally been our intention to concentrate

III. DEVELOPMENT OF THE ANIMAL STALLS CONSTRUCTION TASK

It was our goal to create a task that would be challenging and enjoyable to children across a relatively broad age span, and that would demand strategic behavior that could be observed. A construction task was considered ideal to meet these requirements. The procedure, in outline, is extremely simple. A model block construction is shown to the child, an assortment of construction materials is available, and the child is asked to make another one just like the model.

The task is called Animal Stalls. The construction is made of table blocks arranged to create two, three, or six "stalls" that contain one or more miniature animals and bales of hay. The complexity of the model to be reproduced can be adapted to different ages. The materials used--blocks and miniature animals--are familiar to preschool and primary school children, but the actual problem of constructing something to match a 3-dimensional model is not a task that they have had experience with. The process of construction demands that the child's approach to the problem is made manifest, that is, is externalized. The manipulative skills are not beyond the competence of a 3-year-old, and are still appropriate to a 6-year-old (and older primary school children).

Block play is a staple of the preschool curriculum, and a number of researchers have used construction tasks to study different aspects of children's cognitive problem-solving abilities. But there are no clear leads in the literature that could guide us to gear the complexity of the model to the children's age. Some trial and error was, therefore, unavoidable.

We have tested several different formats, varying the nature of the materials used, the complexity of the model, and the procedures of presen-

tation and instruction. Three versions of Animal Stalls have been used in this study; each is briefly described below.

Three Versions of Animal Stalls

Version 1: Colored Blocks

The first version of Animal Stalls was built with colored wooden blocks.[1] We selected these blocks because they made the model look appealing and were not unlike the blocks generally used in school. (Also they are inexpensive and generally available.)

The major purposes of our work with this first version of the task were to see (1) if the task was appropriate for children aged three through six years; (2) whether it evoked strategic behavior, and (3) if so, whether the strategies could be systematically coded. At the same time that we were selecting and trying out a task, we were testing out and refining our system for observing and recording children's strategies; the two objectives were pursued in tandem.

We started with a structure that had six stalls, but added a simpler, 3-stall model when it became obvious that the 6-stall model was too difficult for the younger children. Preliminary findings are described in more detail in the following section, but here let us note that the task was appropriate, and did evoke strategic behavior that could be coded. In the course of testing, however, it became increasingly clear that the colors of the blocks made the interpretation of the children's behavior more difficult. In the second version of the task, therefore, we decided to eliminate color.

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[1] Sandberg's Rainbow Colored Blocks, available at Woolworth's and many toy stores.

Version 2: Natural Wood with WISC Block Towers

The second version of Animal Stalls was made of natural wood table blocks. These blocks are smaller counterparts to those used in preschool classrooms across the country and, like them, are scaled. The Animal Stalls unit block is 2" x 4" x 1".[1]

We started with a 3-stall and 6-stall model, and later added one with two stalls. As can be seen in the sketches of the Version 2 models (Figures 3, 4, and 5), blocks of several different shapes are used providing distinctive clues for the replication of the model. The 2-stall structure has two, and the 3- and 6-stall models have four columns, each topped with a colored block from the WISC Block Design task. These were included with the expectation that they would yield information about the children's attention to small detail. Each stall contained some objects appropriate to the concept of a farm building. Miniature farm animals and bales of hay were placed in the stalls; in one stall of the 6-stall model, there was a small dumptruck.[2]

This version of Animal Stalls was more successful than the Version 1 colored blocks. In replicating the model, children demonstrated a range of different approaches and strategies. In the course of testing this version, we were able to revise and strengthen the observation system. But we found that the WISC blocks served as a distractor. They were visually so compelling that many children selected them first and, since they could not be used until at least a portion of the structure was built, such early selection was counterproductive. Many children com-

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[1]Available from Childcraft and other educational supply firms.

[2]The farm animals and hay bales are from a set made by Britains, Ltd., and available at Childcraft and other toy and educational supply firms. The truck is Matchbox, available in toy and variety stores.

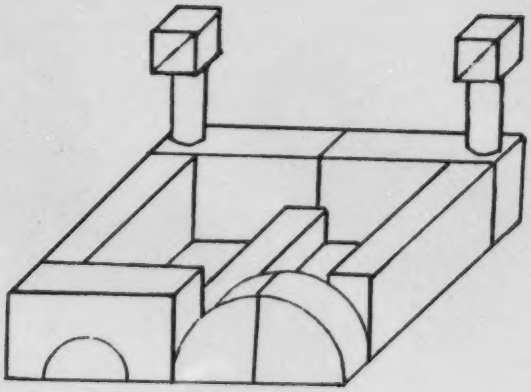

Figure 3. Version 2, Two-Stall, with WISC Blocks. (One or two animals in each stall and bales of hay.)

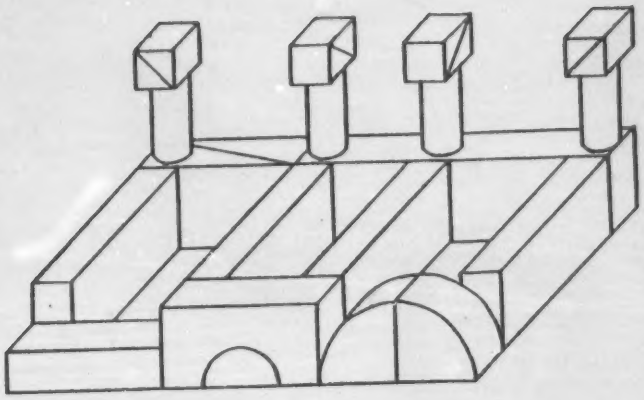

Figure 4. Version 2, Three-Stall with WISC Blocks. (Animals and bales of hay distributed.)

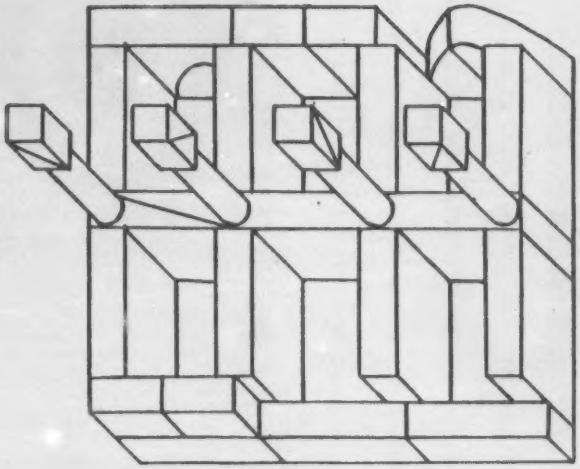

Figure 5. Version 2, Six-Stall with WISC Blocks. (Animals and bales of hay distributed; and dumptruck.)

mented on how much they liked "those blocks." They enjoyed examining them and building with them. But few reproduced the arrangement of blocks exactly, although some placed the WISC blocks systematically so that, for example, "all the tops are red." We decided that the WISC blocks were more of a liability than an asset. They did not yield enough information about attention to detail, and often seemed to interfere with the progress of the task. These considerations led to the development of the present model of Animal Stalls, Version 3.

Version 3: Natural Wood with Arch Superstructure

The third and final version of Animal Stalls also is constructed of table blocks, but it overcomes the empirically determined liabilities of the two earlier versions. There are three models: a 2-stall like that used in Version 2, but without the WISC blocks (see Figure 6); a 3-stall (Figure 7); and a 6-stall model (Figure 8). As in Version 2, miniature animals and hay bales are housed in each stall. In all, there is variation in the block forms used, and the increase in the number of stalls is matched by increase in the complexity of the arch superstructure. Our goal was to have an increasingly complex structure rather than, as in the second WISC towers version, to introduce details that were structurally trivial.

The Sample

The sample of children in all three versions consists of 125 3-, 4-, 5-, and 6-year-old children. The oldest children were a few months beyond their sixth birthday.

Of the 125 children, 80 (64%) attended Head Start, 30 (24%) attended private preschools, and 15 (12%) were in kindergarten in an urban public school. The Head Start children were drawn from four urban Head Start centers and one rural center in upstate New York.

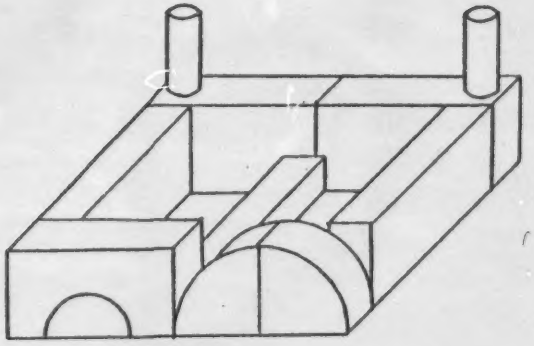

Figure 6. Version 3, Two-Stall with Plain Cylinders. (Animals and hay bales distributed.)

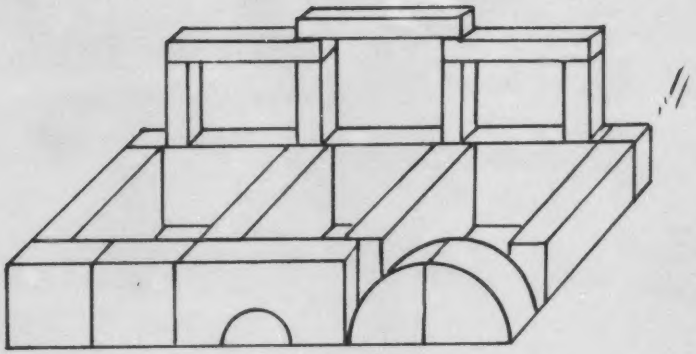

Figure 7. Version 3, Three-Stall with Arch Superstructure. (Animals and hay bales distributed.)

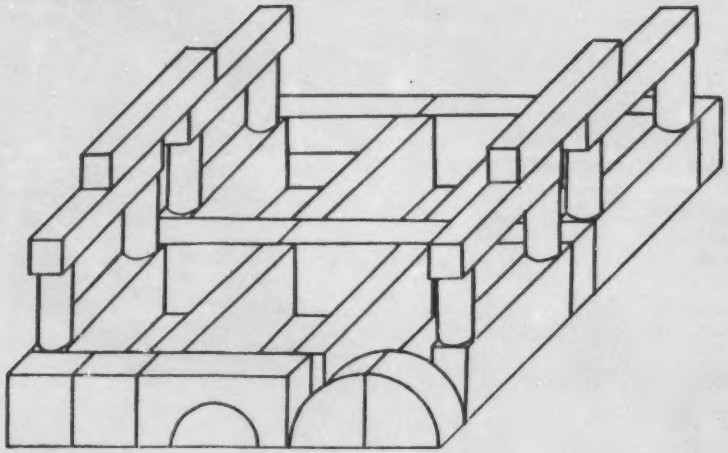

Figure 8. Version 3, Six-Stall with Arch Superstructure. (Animals and hay bales distributed.)

The children are from three ethnic groups--black, hispanic, and white: 27 (22%) black, 40 (32%) hispanic, and 58 (46%) white. The distribution of children by age, ethnic group, and version of the Animal Stalls task is shown in Table 1. Both boys and girls were sampled across all age groups, as can be seen in Table 2.

Table 2

Children Tested on Animal Stalls, By Gender and Age
(three versions combined)

Age	Boys	Girls	Total
3	13	15	28
4	25	25	50
5	20	21	41
6	3	3	6
Total	61	64	125

Procedure for Recruiting Children

The project was described to the center or school director and educational coordinator. Project staff visited the center, met and talked with the administrative staff and relevant teachers, and also met with and described the project to the Parent Advisory Council. A brief written description of the project and the kinds of activities we wished to undertake with the children, as well as permission forms, were distributed to the parents.[1] School information sheets and class lists were also obtained. Only those children whose parents had given permission were asked to do the Animal Stalls.

[1]These forms were prepared in Spanish and English (see Appendix B). All materials for recruitment were prepared at a time when a number of tasks were planned and before we knew the project would be terminated.

Table 1

Children Tested on Three Versions of Animal Stalls
By Type of School Setting, Age, and Ethnicity

Version of Animal Stalls	Head Start Centers: Four Urban B	H	W	Total	Head Start Centers: One Rural B	H	W	Total	Private Preschool B	H	W	Total	Kindergarten B	H	W	Total	Total B	H	W	Total
1. Colored Blocks 3- and 6-Stalls																				
Age																				
3:0 - 3:11	2	12	0	14	-	-	-	-	0	0	4	4	-	-	-	-	2	12	4	18
4:0 - 4:11	5	6	0	11	-	-	-	-	0	0	3	3	-	-	-	-	5	6	3	14
5:0 - 5:11	2	3	0	5	-	-	-	-	0	0	0	0	-	-	-	-	2	3	0	5
6:0	-	-	-	0	-	-	-	-	1	1	1	3	-	-	-	-	1	1	1	3
Total	9	21	0	30	-	-	-	-	1	1	8	10	-	-	-	-	10	22	8	40
2. Natural Wood Blocks with WISC Towers 2-, 3-, 6-Stalls																				
Age																				
3:0 - 3:11	5	0	0	5	-	-	-	-	0	0	5	5	-	-	-	-	5	0	5	10
4:0 - 4:11	6	2	1	9	0	1	14	15	0	0	4	4	-	-	-	-	6	3	19	28
5:0 - 5:11	1	1	-	2	0	0	5	5	0	0	1	1	0	5	4	9	1	6	10	17
6:0	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	1	0	1	0	1
Total	12	3	1	16	-	1	19	20	-	-	10	10	0	6	4	10	12	10	34	56
3. Natural Wood Blocks with Arch Structure 2-, 3-, 6-Stalls																				
Age																				
3:0 - 3:11	1	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	1
4:0 - 4:11	0	4	1	6	-	-	-	-	-	-	2	2	-	-	-	-	0	4	3	7
5:0 - 5:11	3	4	1	8	-	-	-	-	-	-	8	8	0	0	3	3	3	4	12	19
6:0 - 6:3	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1	2	1	0	1	2
Total	4	8	2	14	-	-	-	-	-	-	10	10	1	0	4	5	5	8	16	29
TOTAL				60				20				30				15				125

Center and school staff at all sites were extremely helpful to project staff in arranging meeting times, making space available, and generally facilitating the conduct of the project.

Procedure for Administering Animal Stalls

The procedure for administering Animal Stalls, as well as the conventions adopted for coding strategic behavior and recording the child's construction, have been refined during the course of task development.

In all instances, the Interviewer (I) had made an appointment in advance. She first approached the teacher with a list of children whose parents had given permission for testing. The teacher chose children from that list, usually judging on the basis of the children's current activity, until all the children had been seen. If a child did not want to come, another child was taken. Almost invariably, a child who at first refused would ask to be taken at a later time. More often, children who did not have permission clamored to come (but these children were never tested). Often children would say that their friend who had already done the Animal Stalls had told them about it and that it was fun, or okay, or interesting, or easy.

The physical layout differed from place to place, depending on the kind of space that was available. In all settings, the actual administration was conducted in an area separate from the child's classroom, generally an unused classroom or office. In the testing room, extraneous objects were put away or removed (to the extent feasible). The I had already constructed the models and laid out the materials for the child to use. When possible, the models and space for the child's building

were prepared on the floor. When that could not be done, low, child-sized tables were used. The rationale for the arrangement of the models and materials was to enable the child, especially the younger child, to see the model easily and from more than one vantage point, and to have the materials easily accessible but distant enough from the model so that selection and placement were observable by the I.

All children were interviewed in their preferred or dominant language. For some hispanic children, the language of administration shifted back and forth between Spanish and English, following the child's lead, or the I repeated instructions or questions in the other language to ensure understanding.

The procedure for the Animal Stalls task itself is to show the child a model of the appropriate 2-, 3-, or 6-stall version and ask her/him to make one just like it. If the child completes it successfully, s/he is then asked to make the next one in the series (unless, of course, the 6-stall version is presented first). If the child is unable to begin construction, the I offers encouragement, repeats the instructions and administers the less complex model if the child cannot respond.

Whenever possible, the child's chronological age was used as a guide for determing which version to present first.

> Three year old children were shown the 2-stall model, and asked to do the 3-stall model if their 2-stall construction was "nearly perfect."
>
> Children aged four and five were shown the 3-stall model and asked to do the 6-stall if their 3-stall construction was "nearly perfect."
>
> Children aged six were asked to do the 6-stall model. If they were not able to proceed, they were asked to do the 3-stall.

Blocks and accessories the child will need, as well as a number of additional blocks and animals, are arranged neatly, blocks of similar shape stacked together, much in the way that blocks are arranged on shelves in classrooms. If possible, the materials are ordered on a small set of shelves placed at right angles close to the model and the space the child will use for building.

The I says:

> I'm (we're) interested in how children build things. I have a building here that I made and I'd like you to make one <u>just like it</u>.
>
> What does it look like to you? (If no response, ask: What do you think it is supposed to be? If child doesn't answer, say: We thought it was like a place for farm animals. We call it <u>Animal Stalls</u>. What do you think?)
>
> See these blocks and things? We've brought plenty for you to use. Take whatever you need, okay? Why don't you start now? Remember that it should be just like this one (just like mine).[1]
>
> When child appears to be finished, or stops, I asks: Have you finished? And at the end, I asks: Is yours just like mine?

I starts timing when instructions are completed. I records strategic behavior on the recording form at 15-second intervals. I also records the child's actions and relevant verbalizations, and makes rough sketches of starting approach, building sequence, and major shifts in the child's construction. Time to completion is recorded. A sketch of the model is used to describe the sequence of child's construction.

Results of trials of the <u>Animal Stalls</u> task with 125 preschool and primary school children are presented in the next section.

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[1] In those instances when the child did not seem to understand what was being asked, or seemed unable or unwilling to try to build, the I would offer encouragement, try to check the child's comprehension of the instructions by demonstration. For example, she would select four unit blocks, take two and place one on top of the other and say, "See this, can you make this?" (indicating the other two blocks). Or she would build a three-block arch and ask the child to make one. When the child had done this, and all children could make these simple constructions, the I would turn back to the model and repeat the basic instruction. (In a few instances, the child was still unable to respond.)

IV. PILOTING THE MEASURES: RESULTS AND DISCUSSION

Findings are discussed in general terms for Version 1, the colored blocks, and in more detail for Version 2 and 3 of Animal Stalls. The aims of Version 1 were to establish the viability of the activity itself; to develop administrative procedures including instructions, placement of the materials, and so on; and to clarify and refine the categories in the observation system.

Version 1, the Colored Blocks

This version was tried out with 40 children, aged three through six, in urban Head Start Centers and private schools. There were 24 girls and 16 boys, and most of the children were three and four years old. Black, hispanic, and white children were sampled across the age span (see Table 1). The bulk of the sample was presented with the 6-stall model; nine children, all three-year-olds, were asked to reproduce the 3-stall model. Findings are discussed in terms of the children's success in the task, which was also a measure of task difficulty, and in terms of the kinds of strategies evoked.

Outcome: Completion and Success

The child's finished construction was evaluated for completeness and correctness. Completeness was coded as Complete, Nearly Complete, or Not Applicable in the cases when the child did not attempt to reproduce the model. Accuracy or correctness was coded in terms of correctly placed blocks and animals as All Perfect, Nearly Perfect, Approximately Half Right or Less than Half Right.

For the three-year-olds, the 6-stall model was too difficult, though one seriously attempted the task. Almost all the four-year-olds attempted the task and more than one-third built a complete and successful, or a

recognizable version. The task was easy for the five- and six year-olds. All completed the task and made All Perfect or Nearly Perfect replicas.

When we introduced the 3-stall model to a small group (9) of three-year-olds, four made All Perfect, Nearly Perfect or partially completed structures and the remaining five children built a different structure or found the task too difficult.

Gauging the level of difficulty of the task and trying to match it to the child's age was not easy. Sometimes a child would build something entirely different, which we labeled "builds alternative structure;" or a child might say, "I don't like yours, I'll build my own." At other times it was not clear whether the child was following a design of her or his own, or was trying to reproduce the model and could not do so. But whenever the child was actively building, we were able to observe strategic behavior.

Strategic Behavior

Examination of the protocols of 31 children's efforts to construct the Version 1, 6-stall model shows that the task succeeded in evoking strategies whether or not the model was being accurately replicated. For instance, a child might start off, look carefully at the model, select several blocks and place them on the table. It is soon clear that the child has a goal and a plan for she is building an enclosure, a structure of her own design, which bears only slight resemblance to the model in detail, but is meant to enclose the farm animals. She places several animals inside the structure, and says that she is finished. This is an instance where we do not know whether the child thought she was trying to replicate or had replicated the model.[1] Nevertheless, aside from judgments of outcome,

[1]Later we asked all children whether this building was just like the model. Those who built alternative structures sometimes claimed that their buildings were just like the model.

this sequence yields a good deal of information about strategies.

Table 3 shows the percentage of three-, four-, and five-year-old children who demonstrated strategic behaviors in the course of working on their construction, and the proportion of children who completed and succeeded in the task. We see considerable consistency among the five-year-olds: all but one of them used all of the strategies coded. The three- and four-year-olds were a good deal more variable in whether or not they showed strategic behavior.

One strategy that is more heavily represented than one might expect, especially among the younger children, is Uses Systematic Approach. This is because children, especially the younger children, tended to select blocks by color. Often the child would select several of the red blocks; these were the unit blocks in this set and were used in the model to create outside walls and to divide the stalls from each other. Choosing and placing these blocks correctly qualified as a systematic approach to construction. But properly placing all the red blocks actually required more analysis, foresight and planning than these young children could manage. Choosing the red blocks seemed more often to interfere with the child's effort to build the structure. The confounding of the visual salience of the colored blocks with the approach to construction led to the decision to develop a color neutral version of the task.

In sum, work with the first version of the Animal Stalls construction task showed that:

- the task was viable. It evoked purposeful, goal directed behavior in young children.
- The task elicited a rich array of strategies even when successful completion was beyond the child.
- It enabled us to change, clarify, and refine categories in the observation system.
- It identified problems that needed to be resolved in further development of the task, e.g. the 3-stall model was not a successful baseline for the younger children.

Table 3

Animal Stalls, Version 1, 6-Stall
(Colored Blocks)
Percentage of Children by Use of Strategies and Outcome
(N=31)

		INVOLVEMENT			PLANNING		MONITORING		ACCOMMODATING			OUTCOME	
Age	N	Attends Instr.	En-gaged	Ex-plores	Phys./Verb. Setup	System. Appr.	Checks Model	Descr./Comm. Own Action	Corr. Error	Takes New Appr.	Fine Tunes	Com-pletes	All Perf. Near Perf.
3	12	75	83	50	100	75	83	25	58	67	58	0	0
4	14	43	64	43	36	57	71	43	57	64	21	21	21
5	5	100	100	0	100	100	100	80	100	100	100	100	100

NOTE: The names of some strategies were changed during the development of the system and will therefore not show consistency across tables in this section.

Versions 2 and 3, Natural Wood Blocks, WISC Block Towers, and Arch Superstructure

We briefly summarize the data base for Versions 2 and 3 separately and then combined. The findings from the two versions are then discussed together.

The WISC Block Towers, Version 2, was given to 56 children aged 3.1 to 6.0. The majority of these children (33) did the 3-stall model. Version 3, Arch Superstructure, was given to 29 children. The age range is 3.1 to 6.3.[1] Again, the majority of the children (15) did the 3-stall model.[2]

When the data from both versions are pooled, the N=85; 17 children were given 2-stall, 48 children 3-stall, and 20 children 6-stall models. Fourteen children were asked to replicate two models. In some instances a child who was first given the 6- or 3-stall model and could not begin was then able to proceed with the less complex model (3- or 2-stall). In other cases, children easily finished one model and were given a more complex one. In the analysis presented in this section, the second trials only are reported for these children. As we learned more about matching the difficulty of the task to the child's age, the procedure was improved. Some children tested early in the series who were started with the 6-stall model would have been started on the 3-stall model if they had been seen later. This means that not all children were given an equivalent opportunity to be

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[1] Few three-year-olds could be included because it was late in the school year and most of the children in the three-year-old group had turned four.

[2] The specific distribution is:

	Version 1	Version 2
2-stall	6	11
3-stall	33	15
6-stall	17	3
	56	29

successful on the task, which places constraints on certain kinds of comparisons and analyses of the data.

In presenting the data from Animal Stalls Versions 1 and 2, we first examine the products children made, that is, the outcome of the task. We then present the strategies they used, describing general trends and whether or not particular strategies or patterns are associated with outcome characteristics. Data from a small substudy are then presented in which 10 children were observed with the CSAS in their classroom and in the Animal Stalls task.

Let us note first that the children's response to the task itself was generally positive; only a few children were unable to tackle it. Most children seemed to enjoy the task even though it was apparent from many of their initial responses that the request of "make one just like mine" was not one that they were accustomed to. Some looked surprised. Some looked at the model and said, "Oh, that looks hard" and then proceeded to build it with ease. Several said they were finished when they had completed the block structure, but had not put in the animals. Some talked a good deal while they worked, either about what they were doing or "making conversation" with the adult; others said not a word.

Outcome: Completion and Success

The end product of the construction process was analyzed to yield a Completion Success Index (CSI) which is arrived at by dividing the number of items correctly placed by the total number of items in the model. The CSI is a measure of how successfully the children could deal with the task and was also used, together with other considerations, to reflect back on process. The count of the number of items correctly placed gives a very

good indication of the accuracy with which the structure is constructed when it is close to perfect. But it can be misleadingly inflated when the errors are few but crucial; and it does not discriminate among constructions in which no item is placed correctly. The protocols were therefore sorted into five groups, in which accuracy of the construction weighed heavily but was not the sole criterion. For those children who made two constructions, only the second was considered. Thus, a child who could not make a 6-stall but did make a 3-stall model was categorized on the basis of the 3-stall. Similarly, a child who made a perfect 2-stall and then a much less adequate 3-stall would also be categorized on the basis of the 3-stall construction.

Criteria for placement in the five categories are as follows:[1]

Category 1 (N=13)

The construction is All Perfect.

The construction is Nearly Perfect, i.e.

- -There are one or two unobtrusive substitutions which do not affect the model structure, e.g. 1 unit for split unit, 2 units for double unit.
- -Placement may not be completely symmetrical, e.g. of cylinders or arches.
- -One or two animals may be omitted or substituted; they may not be correctly oriented; hay bales may be omitted or not correctly distributed.

(In Version 2, color matching of the WISC Blocks, which was very rare, was noted, but not considered in categorization.)

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[1] Two of the authors (EKS and DBW) defined the categories and sorted the protocols independently; disagreements were discussed and a consensus achieved in each. Category definitions were revised during the rating process. The ten children in the substudy discussed later in this section are not included in this analysis. Therefore N=75.

Category 2 (N=9)

The structure closely resembles the model. It may have errors like those in Category 1, but in addition

-There are conspicuous or significant omissions or additions, e.g. a gate or divider is omitted; a block is added to perimeter or divider; an arch is substituted for a unit block.

-There may be small scale reversals, e.g. of gates.

Category 3 (N=17)

The model has not been copied but is recognizable, though not necessarily integrated. Salient features are present. The number of stalls is correct (in a few instances, in the 6-stall, when many salient features are present and the number of stalls is incorrect, the structure is categorized here).

There are always significant omissions, additions, or substitutions. There may also be shifts in orientation or large scale reversals, e.g. of the back and front of the structure.

Some efforts to reproduce the 6-stall model which are essentially unsuccessful but were elaborate multi-stall constructions of many blocks and accessories were categorized as 3.

Category 4 (N=28)

The model is not recognizable. Buildings may consist of:

-A line of blocks.

-A line of blocks with a few animals lined up next to them.

-Simple enclosures or part enclosures, made of identical or varied blocks, often with animals inside.

-Occasionally a salient feature of the model is used, e.g. cylinders.

Category 5 (N=8)

A few blocks are selected and arranged in no coherent pattern. Some blocks may be those from the model.

There is no structure at all. The child was unable to undertake the task, or added a few blocks to the model.

(Children in this category typically give up the task.)

Table 4

Animal Stalls: Outcome Categories
And Child and Task Characteristics

	CSI Category				
	1	2	3	4	5
N Girls (N=36)	7	3	10	13	3
Boys (N=39)	6	6	7	15	5
Total (N=75[1])	13	9	17	28	8
Age					
Range	3.4-6.0	3.9-5.9	3.11-5.11	3.0-6.3	3.11-5.1
Median	4.10	4.11	5.3	4.9	4.6
% Correct (CSI)					
Range	79-100	59-98	0-90	NA[2]	NA[2]
$\bar{X}$	95	77	41		
Task Complexity					
2-Stall	2	3	2	7	3
3-Stall	5	5	8	16	4
6-Stall	6	1	7	5	1

[1]The data do not include the 10 children in the substudy reported later in this section.

[2]The concept of correctness does not apply to the productions of children in categories 4 and 5.

If we look at the distribution across these five categories in Table 4, we can see that both the extreme categories contain a relatively small number of children (17% and 11% of the sample, respectively). The bulk of the group is in the middle categories, although the distribution is skewed toward the lower end. Constructions in Categories 1 and 2 can be considered as adequate reconstructions of the model; 29% of the children fall into these two groups. Those in Category 3 are marginal and comprise 23% of the group; those in Category 4, the largest, 37%.

Of the 13 children in Category 1, six are boys, seven are girls, and the age range is from 3.4 to 6.0, with a median of 4.10. The group therefore covers the age range, and boys and girls are equally represented. The categorization was based on two constructions of the 2-stall, five of the 3-stall, and six of the 6-stall. The youngest child made an almost perfect 3-stall, the oldest an almost perfect 6-stall.

The majority of the children built complete and accurate structures: eight of the 13 were 100% perfect. The lowest CSI score is 79%, and the mean 94.8%. Criteria for inclusion in Category 1 are stringent because we wanted to see if the most accurate and complete constructions were achieved by means of different or similar strategies than those used in less adequate constructions.

Children in Category 2 made clearly recognizable structures. As can be seen in Table 4, there are nine children in this category, three girls and six boys, who range in age from 3.9 to 5.9 with a median of 4.11. The categorization was based on three constructions of the 2-stall, five of the 3-stall, and one of the 6-stall. Six of the constructions were complete, three were missing a basic and salient feature, such as a stall divider,

of the cylinders and WISC blocks. Their CSI scores range from 59% (Allan [5.01][1] who left out the cylinders and WISC blocks on an otherwise perfect 3-stall), to 98%, with a mean of 77.3%.

The third category encompasses a wider range of different kinds of errors, omissions and distortions, although one can still tell what the original model was. There are 17 children in this category, seven boys and ten girls, from 3.11 to 5.11. The median age is 5.3. The categorization includes two children's efforts to construct the 2-stall, eight the 3-stall, and seven the 6-stall. The range of the CSI score is from zero (5 cases) to 95%. Five children in this category have a relatively high percentage of correctly placed blocks (69%-95%). They were categorized here because of the significant nature of the substitutions and omissions in their constructions or, in one case, because the child incorporated a wall of the model in her construction.

The structures categorized as 1 and 2 can easily be visualized by referring to Figures 3-8. Those in Category 3 are only partly represented by these figures. For example, Delia (5.3) built what was essentially a 1-stall version of the 2-stall, but with two sets of animals properly aligned. The 3-stall structure that Riana (5.5) built contained a number of substitutions which changed its look considerably, but it was clearly a 3-stall structure. Others in this category made structures whose basic form differed from the model in important ways. Nick (4.5) made an open front 3-stall that looked as if he had not finished, although he said that he had. Naomi's (5.0) rendition of the 3-stall at first glance seemed completely unrelated to the model. But she had reconstructed three stalls, though

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[1]All names used in this report are fictional and are not the names of any child seen.

each had its own independent walls. Two of the stalls were off at one side at an angle to the table edge and the other was directly adjacent to the left side of the model, a mirror image of the left hand stall of the model, producing a reversal. Naomi's construction points up a problem that a number of children had, of integrating the parts of the structure into a whole. To reproduce the model, the child must be able to analyze its components and also put them together into a coherent whole structure.

The fourth group of 28 children contains the broadest variation in type of structures, but none resembled the model. There are 15 boys and 13 girls in this group. The age range spans that of the sample, from 3:0 to 6:3, with a median of 4:9. The categorization was based on seven efforts to reproduce the 2-stall, 15 the 3-stall, and five the 6-stall model.

Of the 28, 22 children (79%) placed none of the materials correctly; the other six children had a mean CSI of 42%. The constructions made by children in this group could not be complete since the basic criterion for inclusion in this group was that the model was unrecognizable.

Several children used the model itself as a base for construction. Although the I repeated that he should make his own building, Zeke (6:3), for example, built onto the model and round it, creating a relatively elaborate structure, and adding pens for animals in the rear. Others made what we have referred to as alternative structures, sometimes a line of blocks with animals arranged alongside. A common variant was a simple enclosure into which animals were placed. Some of these enclosures were extremely simple. Others were quite elaborate with blocks used as dividers. These structures all seemed to be efforts to create stalls or pens for

animals, in the spirit of the models. Some children used the same animals as those in the model, others used these and additional animals, and still others selected animals without apparent reference to the models.

In Category 5, there are eight children who essentially could not cope with the demands of the task. Four of them took a few blocks and arranged them in a fragmented way, perhaps placing an animal next to one of them. One child made a line of four unit blocks and also placed four cylinders, with WISC blocks on top of them, on a front gate of the model. Another added a few blocks to the model, making no construction of her own. Two of the children represent the extreme: they said nothing and did not respond to encouragement or demonstration. Peter (4.6), for example, simply stared at the model, did not touch any of the material, and said nothing. Obviously social strategies play a role here. Other children no more able to reproduce the model, mobilized some response--small talk with the I, or using the materials for exploration and play.

Caveats

The category divisions are statements about the adequacy of performance in this situation and should not be taken as statements about any child's level of competence. The situation is being tested, not the children. Some children, especially those tested earlier in the series, were asked to make constructions that were beyond their level of capability. They therefore had no chance to respond to the proper opportunity. Two four-year-old children in Category 5, for example, who were shown the 6-stall model first, would have been asked to build the 3-stall model if they had been seen later. Sequence of presentation also affects performance. A child who successfully completes the 2-stall structure might move on to the 3-stall model with confidence. If she had been shown the 3-stall model first, it might have seemed too formidable.

Teacher Ratings

Classroom teachers were asked to rate the sample children on a 3-point scale on a series of questions culminating in an overall assessment of the child's general competence in social situations and on tasks, especially school-related tasks (see Appendix C for the Teacher Rating Form). The goal was to alert the teacher, in making her ratings, to the kinds of dimensions in which we were interested, that is, the aspects of competence that we considered most relevant to the measures used in the study.

Teacher ratings are available for 53 (71%) of these 75 children. (Certain teachers were unable to do the ratings, therefore the missing data represent all children from a particular class, not individual children in any class.)

The teacher ratings serve as an important external criterion of children's effective functioning in the school situation, but cannot be taken as a measure of validity of the Animal Stalls procedure, or of our categories. First, each teacher tends to rate the children in her classroom in terms of the group, rather than in absolute terms, so that pooling the ratings introduces an unknown amount of error. In addition, the teachers were not given explicit directions about how to make the high, medium and low judgments of competence in tasks and social situations. It is clear in Table 5 that the teachers were loathe to rate children as low, and the distribution is skewed toward the upper ratings. Only six children (11%) were given low ratings, while 24 (45%) were rated high. With these caveats in mind, there is, nevertheless, an association between the ratings given by the teachers and the categorization in terms of the outcome categories. None of the children in Categories 1 or 2 was given a low rating, and none in Category 5 was rated as high. On the other hand, there are 12 children in Categories 3 and 4 who were given a high rating by their teachers. There is error built into each of these ratings, but

Table 5

Animal Stalls: Outcome Categories and Ratings
Of the Children's Social/Mastery Competence by Their Teachers
(N=53)

Teacher Ratings	Outcome Category 1	2	3	4	5	Total	%
High	9	3	7	5	0	24	45
Medium	1	4	4	11	3	23	43
Low	0	0	2	2	2	6	11
Total N	10	7	13	18	5	53	

the degree of agreement at the extremes suggests that there is a correspondence between children's competence in the Animal Stalls task and in their teacher's assessment of their competence in school-related tasks.

Strategies Used and Their Relation to Outcome

In reporting the findings of our use of the CSAS to observe children in the Animal Stalls task, we present and discuss data on the time children took in the task, the nature and extent of their Involvement in it, and the kinds and frequency of Planning, Monitoring, and Accommodating strategies they used. We then report on the small substudy in which ten children were observed in their classroom as well as in the Animal Stalls. Finally, we discuss the implications of this work and suggest some future directions it might take.

Time

The time children spent doing the Animal Stalls task creates a frame within which strategic behavior is visible. There was a good deal of variation in the amount of time taken, and variation within each outcome category group was considerable (see Table 6). In Category 1, all children were successful in replicating a model, but the time it took them varied considerably.

Perhaps most notable is the relatively short time spent by children in Category 5 who, because they were least able to cope with the task, did very little; and several gave up. But the amount of time taken by this sample of children in general is not associated with their success in the task.

It might be expected that the time taken to reproduce the model would vary with the complexity of the structure, and inspection of Table 7 suggests that this is generally so. For the group as a whole, it took a little more than twice as long to make a 6-stall than a 3-stall construction. The

Table 6

Animal Stalls: Overview of Strategic Behavior Variables

Strategic Behavior Variables		Outcome Categories 1	2	3	4	5[1]	Total[2]
	N	13	9	17	28	6	73
Time (in minutes)							
Total	$\bar{X}$	10.1	8.5	11.7	8.8	6.4	9.6
	SD	2.1	2.7	4.9	4.9	2.6	4.0
	Range	7-20	3-11	5-25	2-20	5-10	2-25
Involvement (%)							
On Task	$\bar{X}$	95	93	85	68	29	76
	SD	8.0	8.3	18.6	27.9	25.1	20.8
	Range	80-100	80-100	50-100	0-100	0-80	0-100
Explores	$\bar{X}$	04	07	12	33	43	21
	SD[3]	-	-	14.4	27.2	-	20.4
	Range	0-15	0-20	0-50	0-100	0-80	0-100
Distracted	$\bar{X}$	01	005	03	04	28	05
	SD[3]	-	-	-	-	23.1	8.3
	Range	0-10	0-05	0-20	0-25	0-75	0-75
Planning (freq.)							
Total Positive	$\bar{X}$	25.8	18.7	18	9.8	2.3	15
	SD	9.1	8.2	6.7	4.4	1.7	6.2
	Range	16-41	8-24	9-28	4-22	0-4	0-41
Monitoring (freq.)							
Total Positive	$\bar{X}$	15.2	11.3	9.2	6	4.7	9
	SD	7.4	4.0	3.6	1.4	3.8	4.7
	Range	7-33	5-24	2-26	1-12	1-7	1-33
Accommodating (freq.)							
Total Positive	$\bar{X}$	6.2	3.4	7.6	2.3	2.3	4.4
	SD	3.5	2.2	6.9	2.3	-	4.0
	Range	0-14	0-7	0-33	0-10	0-8	0-33

[1] Two children in Category 5 who did not undertake the task are not included.

[2] Children in the substudy (N=10) are not included in this analysis.

[3] Standard deviations are not presented when there is zero incidence of the variable for a majority of the children.

Table 7

Animal Stalls: Time Taken and Specific Strategies Used According to Model Complexity

Strategic Behavior Variables		Outcome Categories 1	2	3	4	5[1]	Total[2]
	N	13	9	17	28	6	73
Time[3] (in minutes)							
2-Stall	$\bar{X}$	10	6	6	4.7	6.7	6.0
	Range	10	3-10	5-7	2-10	5-8.5	2-10
3-Stall	$\bar{X}$	11	9.6	11.5	8.7	5	9.5
	Range	8-15	8-10	7-20	5-15	3-7	3-20
6-Stall	$\bar{X}$	11	11	13.6	14.8	10	12.8
	Range	7-20	-	10-25	5-20	-	5-25
Planning							
System. Appr. (freq.)							
Total	$\bar{X}$	23.3	16.8	16.1	8.0	1.7	9.6
	SD	10.5	7.9	6.9	4.5	1.3	6.6
	Range	14-36	6-34	7-27	3-21	0-3	0-30
2-Stall	$\bar{X}$	15	11.3	10.5	5.3	1.5	6.9
	Range	15	6-15	7-14	3-11	0-3	0-15
3-Stall	$\bar{X}$	18.4	19.8	13.4	8.2	0.7	11.7
	Range	14-21	17-23	8-25	4-21	0-2	0-25
6-Stall	$\bar{X}$	30.2	34	20.9	11.2	4	21.4
	Range	22-36	-	15-27	8-16	-	3-36
Monitoring							
Checks Model (freq.)							
Total	$\bar{X}$	11.8	8.8	7.9	4.2	3.6	7.0
	SD	5.14	3.07	5.63	3.0	2.56	4.04
	Range	7-26	5-18	2-26	1-10	1-10	1-26
2-Stall	$\bar{X}$	9	7.3	6	4	5.5	5.5
	Range	8-10	5-11	5-7	1-10	1-10	1-10
3-Stall	$\bar{X}$	11.8	7.8	8.9	4.4	3	6.7
	Range	7-15	6-9	2-26	1-10	1-7	1-26
6-Stall	$\bar{X}$	12.8	18	7.3	4.2	5	8.6
	Range	6-26	-	3-12	1-9	-	1-26
Accommodating[4]							
Revise Action (freq.)	$\bar{X}$	2.4	2.2	3.1	1.1	0	1.8
	SD	1.7	1.7	2.8	1.5	-	1.8
	Range	0-7	0-6	0-13	0-4	-	0-13
Finetune (freq.)	$\bar{X}$	3.8	1.7	4.5	1.2	2.3	2.6
	SD[5]	2.2	1.6	4.3	1.2	-	2.5
	Range	0-7	0-5	0-20	0-5	0-4	0-20

[1] Two children in Category 5 who did not undertake the task are not included.

[2] Children in the substudy (N=10) are not included in this analysis.

[3] When the data are presented separately for the 2-, 3- and 6-Stall models, it should be remembered that the Ns vary from cell to cell. For groups 2 and 5 on the 6-Stall, N=1; therefore there is no range.

[4] Accommodating strategies are not presented separately for the 2-, 3- and 6-Stall models because the Ns are too small.

[5] Standard deviations are not presented when there is zero incidence of the variables for a majority of the children.

least difference in the average amount of time for children is found in Group 1, though we see a sizeable range in time spent making the 3- and 6-stall models.

Involvement

Involvement is taken as an indicator of motivation, and the primary question is whether or not the child becomes involved in the task as presented. The group as a whole was rated as On Task 76% of the time, as Exploring the materials 20%, and as Distracted for only 5% of the time (see Table 6). There is a clear relation between the kind of involvement in the task and the outcome categorization. The amount of time spent On Task decreases dramatically from the more consistently competent performance of children in Categories 1 and 2 (with means of 95% and 93%, respectively) to the less competent performance of those in Categories 4 and 5 (68% and 29%, respectively). There is a corresponding increase in the amount of time spent in Exploration. Only the children in the lowest category were Distracted for a significant amount of time (28%), although a few individual children in other categories were coded as Distracted, as can be seen from the range.

Inspection of the data shows considerable consistency for individuals and across the different models. The children who made two constructions generally showed very little difference in involvement in their two performances. When they were considered primarily On Task for the first construction, they would be so coded for the second. A child might, for instance, have spent a minute playing with the animals before embarking on the second construction but, by and large, they tackled each one with the same spirit of engagement. The only exception to this was a five-year-old who, when presented with the 6-stall, just tinkered with the animals but,

when shifted to the 3-stall, built a partial structure and was coded as 80% On Task and 20% of the time as Exploring. Since involvement does not appear to vary with the complexity of the structure, we do not present the data separately for the 2-, 3-, and 6-stall models.

In general, being On Task is a necessary but not sufficient condition for effective performance. A high percentage of time spent On Task characterizes the children who were successful in replicating the model; they were consistently goal-directed. \Others, nevertheless, were purposefully absorbed in building a structure, even if it did not turn out to resemble the model. A significant amount of time spent in Exploration occurs only among the children in Categories 4 and 5, and the latter is the only group that shows more than a miniscule proportion of time spent as Distracted. In the context of a structured task situation, exploring is a way of not responding to task demands; distraction is a behavioral expression of the inability to cope with the task.

The final question subsumed by the construct of Involvement is whether or not the child Attends to Instructions. This turns out not to be relevant in the structured situation because, by its nature, the situation demands that the child pay attention when the I explains what is being asked. It is more relevant when there is a series of activities, each requiring different instructions or, of course, in the classroom. But here, all children listened to the instructions.

Planning Strategies

Planning strategies are an indication of the child's organization of purpose and behavior. Planning, it will be remembered, is taken as a process that occurs not only at the beginning of an activity, but throughout the sequence of actions. Planning strategies are, in these data, clearly a significant aspect of performance.

The relation between the sheer frequency of Planning strategies and the outcome categorization is striking, as can be seen in Table 6.[1] The maximum number of positive Planning strategies used by children in Category 1 far exceeds that used by children in any of the other categories, and the number decreases with the adequacy of the outcome. There is, of course, a wide range of use of positive Planning strategies by children in all categories except Category 5; these children characteristically use extremely few strategies.

The total number of positive Planning strategies includes four specific strategies: Physical Setup, Predicting Outcome, Verbalizing Task Requirements, and Using a Systematic Approach. The first three occur infrequently and are discussed briefly below. Using a Systematic Approach makes the greatest contribution to the total, and is undoubtedly the most important of the Planning strategies in these data.

The child's activities in preparing for construction have significant consequences for the conduct and outcome of the construction activity. This is especially notable in coding of Physical Setup. Here, the child's selection and placement of appropriate materials (blocks and animals) is coded. Some select on a one-by-one basis. More commonly, children select a few appropriate blocks, begin construction, return to select more, add these to the construction, and continue this process. Some bring large numbers, but have selected them, or eliminated those not necessary. When they prepared the space and selected their materials, they were coded as showing positive Planning strategies.

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[1] Time was recorded in 15-second intervals only in the latter phase of data collection. In the earlier phase, internal time points were not consistently recorded, and there are therefore no equivalent intervals. In order to use data from the entire sample, strategies are presented in terms of frequency of occurrence.

Sometimes a child would begin to build very close to the edge of the table or, barely examining the supply, would bring a collection of blocks and, without arrangement, drop them in front of the model. The most extreme examples of counterproductive Physical Setup were instances where the child piled the blocks he planned to use in the area available for building, thus practically making it impossible to make a construction. After this had happened several times, we began to intervene, since this early negative strategy essentially precluded the possibility of further effective strategic behavior. In the latter part of the testing period, we therefore specified the area where the child should build his or her construction. If the child began to pile blocks in that space, the I would say, "Why don't you put the blocks over here so that you can have space to build..." (The child would nevertheless have been coded as using a negative Planning strategy.) Approximately a quarter of the children (19) were so coded. Two of them are in Category 1, none in Category 2, five in Category 3, seven in Category 4, and five (of the six children) in Category 5. The numbers are small but certainly suggest that such negative preparatory activity is more common when performance is less effective.

Predicting Outcome, that is, announcing in advance what one is going to do, is obviously articulating a plan. Very few children made such statements. A few children stated their plan not to try to match the model. They would say, "I don't like yours. I'm going to make a different kind of barn." (Such statements also inform us that the child is perfectly aware that the construction she or he has built is not intended as a match.)

Another strategy considered to indicate planning and organization is Verbalizes Rules or Task Requirements. This was seldom coded. It is more pertinent in the social situation of the classroom, or in any situation

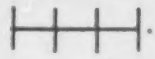
where the child is in an activity with someone else. Here, comments about the task, about one's progress or lack of progress, and comments that could be construed as reflecting task requirements were more likely to be coded under Monitoring, as Describes or Comments on Work.

The child's use of a Systematic Approach is the critical strategy coded under the rubric of Planning. When the child goes about the process of making a construction in an organized way, s/he is coded as using a systematic approach. The observable action is the sign that the child has a plan and is following it. The child may be proceeding systematically even when the end result is quite different from the model. (The negative of this strategy is not a matter of incorrectness, but evidence of being disorganized.)

As can be seen in Table 7, the relation between the use of a Systematic Approach and the outcome categories parallels that for total positive Planning strategies. It is the application of system that contributes most to the Planning construct and that also is clearly associated with effective performance. In examining the use of a Systematic Approach, it is necessary to take account of the size and complexity of the model being reproduced. It follows logically that a more complex structure with more parts requires more actions and, therefore, more instances of the application of system.

If we look at Table 7, we see that in all categories the means are higher for the 3-stall than the 2-stall and, again, higher for the 6-stall than the 3-stall. Most striking is that not only do the children in Categories 4 and 5 use a systematic approach much less often than the children in the other groups but, especially for those in Category 5, there is little relation between frequency of this strategy and the complexity of the model.

In addition to the systematic approach that can be observed in the course of the child's construction, there is another sense in which evidence of system can be inferred. Examining the way the child goes about putting the structure together, the sequence of construction, gives an insight into the child's analysis of the structure and how s/he conceives of reconstructing it. (Although this was not included in the coding of Systematic Approach, sequence was recorded through the sketch of the child's construction.) A considerable number of children built the structure stall by stall. Cylinders and WISC blocks or arches, and then animals, were characteristically the last items added.

Jonah was notable for the systematic way he built the 3-stall. He started with the back wall, built the side walls, then the front gates, then placed the cylinders and WISC blocks, and finally put the animals in their stalls. His construction was not perfect (he used a unit instead a split block for the left back wall, omitted an animal, did not space the cylinders evenly), but the smoothness of the construction process suggests a clear understanding of the structure, and a plan for executing it. Paul's construction of the 6-stall shows a different kind of analysis. He placed the central "rib" structure first:  .

These strategies are essentially procedural strategies, and tied to the particularities of the task. Nevertheless, they suggest an analytic approach that is associated with effective performance. The illustrations are constructions made by children in Category 1, although the sequence of building was not among the criteria for categorization.

Monitoring Strategies

Monitoring one's performance in any task is essential; it is especially important when the task requires coordination with an external model. The

pattern of positive Monitoring strategies for the five outcome categories is comparable to that for Planning strategies, although the number of Planning strategies considerably exceeds Monitoring in frequency of occurrence (see Table 6). The average for the group as a whole is 9, with a very broad range (1-33).

Three discrete strategies are pooled to yield this total: Checks Model, Describes or Comments on Work, and Comments on the Ease or Difficulty of the Task. Of these, by far the major contribution is made by Checks Model. Checking the model is obviously a prerequisite to selecting and placing the material. All the children examined the model at the beginning of the activity, even those who built structures totally different from it. Typically, the child checks the model, checks the supply of blocks and animals, selects, and places.[1] The child's checking of the model is an indication that s/he is doing something that s/he knows is pointed toward a particular and defined end, that is, reproducing the model.

Table 7 shows that, for the group as a whole, the number of instances of Checking the Model does increase with the complexity of the model itself, and this pattern characterizes the performance of the children in the two top groups. Interestingly, the pattern breaks down for the children in Categories 3, 4, and 5. Especially for those in Categories 4 and 5, neither the range nor the means change in any orderly way from the 2-stall to the 6-stall.

For some children, the distribution of the Checks Model code points to a fall off in performance. The child starts off building the model, and

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[1]This sequence also reinforces the point that we are dealing with a recursive model. While it is possible to separate planning and monitoring conceptually, it is difficult to separate them in behavior. Checks model/checks resources involves both planning and monitoring. The monitoring is what we see during the checking action.

then drifts into exploration and is no longer actively attempting to build the model. This shift is signaled by the fact that the child is not checking the model.

It would be a mistake, however, to conclude that the number of times the child checks the model is invariably an index of effectiveness. Paul (whose approach to building was described above) checked the model about nine times during the first two minutes, and then not again until close to completion. The child's early inspection and checking of the model can enable him or her to create an internal representation of what it looks like and what is required to reconstruct it. It is not necessary to check the model continuously. There is probably an optimal amount of checking to be done. Younger and less advanced children need to look at the model more often; more developmentally advanced children have more sophisticated strategies for holding in mind what they have observed. This underlines the fact that more, or more frequent use of, some strategies is not necessarily better, more productive, or more developmentally advanced.

Describing or Commenting on One's Work in the process of an activity is a means of controlling one's behavior, in the Vygotskian sense. The child's commentary that accompanies her or his work is a kind of loud thinking that covers description of the action, the features of the model, or aspects of the materials. Slightly more than half of the children (55%) made such comments. Some children work silently and presumably are thinking about what they are doing. For this age group, such comments probably are also a reflection of ease in the situation or personal style.

Statements about the Ease or Difficulty of the Task were made by only a few children (6) and, when they are made, do not necessarily relate to an observer's view of how easy or difficult the child is actually finding the task.

Accommodating Strategies

Accommodating to the demands of the task, and of the materials is, of course, an integral feature of the activity. What we are able to observe, however, are the kinds of accommodative strategies that are, as it were, writ large. Accommodating strategies occur much less often in the Animal Stalls situation than either Planning or Monitoring strategies (see Table 6). The mean for the group as a whole is 4.4. The pattern of frequency, unlike that for Planning and Monitoring, is not systematically associated with outcome. The highest incidence of Accommodation occurs in Groups 1 and 3. Children in Category 1 turn out a first-class performance, which almost always requires some Accommodation. The high mean and variability in Category 3 is largely due to the idiosyncratic performance of one child, Natasha, described below. Children in Category 4 show very little Accommodation; they are, for the most part, not actively trying to make the model. And those in Category 5 tend not to use Accommodating strategies (four of the six have zero on this measure).

Two strategies contribute to the total of positive Accommodating strategies: Revise Action and Finetuning.

It is obvious that Revising Action, that is, correcting an error or taking a new approach, is only appropriate when an error has been made or a new approach required. Sometimes a child will try a new approach when what s/he has been doing seems perfectly adequate (e.g., change a perfectly placed block), but by and large most revisions were efforts to improve performance.

Finetuning is a strategy that has an optimal frequency. If it does not occur, the outcome is likely to be somewhat messy: some finetuning is necessary to align the blocks, place the cylinders or arch supports in the

proper spots to balance each other, straighten the walls of the stalls, make the animals stand up and in the proper orientation, and so on. But a great deal of finetuning usually signifies either excessive fussing or that the child is making continuous adjustments to a seriously flawed structure. An extreme example is Natasha (5.11) who, in building the 3-stall with arches, did not put the back walls on. When she then tried to build the arches, she put supports on the ends of the stall's walls. They were too far apart to support the tops of the arches. She tried to adjust the side walls, changed the position of the supports, and everything fell. She tried to fix it repeatedly, never seeing the basic error that was the source of the difficulty.

Table 7 shows the incidence of Revises Action and Finetuning for each outcome category and the group as a whole. It can be seen that the incidence is low and the pattern for each is the same as that for total positive Accommodating strategies which they comprise.

Asking for Help is an Accommodating strategy that was not included in the total of positive Accommodating strategies because of its low frequency and positive-negative ambiguity. Eleven children asked for help, six of them in Category 4; and three of the children in Category 5, by doing and saying nothing, were essentially asking to be saved from what for them was an impossible situation. In this sense, Asking for Help is a positive strategy: it is an active rather than a passive or frozen response to difficulty.

Summary

The time these children took in the task showed no clear pattern. The variability was considerable, and some of the least competent builders took the shortest time.

The children's On Task Involvement was high for the whole group and did not discriminate accuracy of replication. However, only children in Categories 4 and 5 tended to Explore. The proportion of time that the children were Distracted was extremely low, except for those in Category 5.

As far as children's strategies are concerned, their Planning strategies were the most frequent and were clearly related to outcome. Children in Category 1 used Planning strategies the most often, and these frequencies decrease with a decrease in the adequacy of outcome. Using a Systematic Approach was the dominant Planning strategy and echoed the systematic pattern seen in the use of Planning strategies as a whole, with highest and lowest frequencies in Categories 1 and 5 respectively. Children who did not organize and group materials appropriately (Physical Setup) were likely to make less adequate structures. Predicting Outcome or Verbalizing Rules or Task Requirements were rarely used.

Monitoring strategies, like the children's Planning strategies, were positively associated with outcome, with the highest groups showing the greatest and the lowest groups the least frequency. However, there was, in general, a lower incidence of Monitoring than of Planning. By far the most frequent Monitoring strategy was Checking the Model which, of course, is built into the nature of the task. Use of this strategy also increased with increased model complexity. A decrease in this strategy was sometimes a signal that children were drifting off task. Describing and Commenting on One's Work and Commenting about the Ease or Difficulty of the Task were infrequent, and the latter was an unreliable indicator of how children actually performed in the task.

Accommodating strategies were least frequently used and, while they showed some provocative and interesting patterns, were not systematically related to outcome.

For the sample as a whole, negative Mastery strategies were extremely infrequent, a pattern that is also in evidence in the substudy reported below.

The Substudy

The purpose of the substudy was to try out the same observation system, the CSAS, in the natural classroom setting and in the Animal Stalls task. From the outset, our intent was to develop an observational tool that would be applicable both in the classroom and in a structured situation. The natural course of classroom activities was considered an important place for observing children's strategic behavior. Further, analysis of the similarities and differences in strategic behavior in the classroom setting and in the structured situation was expected to help to clarify the conceptualization of strategic behavior and refine the observation system. Early observation in classrooms was an important source for developing category definitions and scoring conventions. The classroom data presented in this report are from a small substudy of ten children who were observed both in the familiar context of their classroom and in the Animal Stalls, a novel task outside the classroom.

The sample in the substudy consisted of ten white four- and five-year-old children (5 girls and 5 boys) from the same classroom in a suburban prekindergarten (mean age was 5.3). Each child was observed in the natural classroom setting and in the Animal Stalls, using the CSAS. The teacher, as in the larger sample, rated the children on a number of Social and Mastery competence characteristics (see Appendix C) and also rated each child overall (high, medium, or low) in Social and Mastery competence. There were therefore three data sources for each child: the classroom observations, the Animal Stalls, and the teacher's rating.

Classroom Observation Procedures

Each child was observed for six 10-minute periods in the classroom setting.[1] A modified time sampling method was used in which three of the observations were begun at the start of a social interaction and the other three at the beginning of a Mastery task. Observations were scheduled at times when the children were free to engage in Social interactions or Mastery activities.[2] The Mastery activities included work with materials usually out on the shelves for children to use, as well as special daily projects laid out on specified tables or work spaces. The teacher or aide was usually available in these project areas for consultation, but children were encouraged to do the tasks independently.

Observations of each child were spaced over several days to minimize the possibility of seeing the child on an atypical day. Sometimes children were absent so the observations stretched out over two, or at the most, three weeks for a given child.

Two classroom observers were used, both with experience in doing classroom observations with structured categories. They worked together until they reached an inter-observer agreement of 90-100% in all categories before beginning the observations.

At the time of each classroom observation, the observers waited until the child to be observed began a Social interaction or purposeful activity with materials and recorded the child's behavior in the relevant categories for 10 consecutive minutes. The observation was continued for the full

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[1]Bronson's (1978) work suggests that this procedure provides a reasonably reliable sample of Social and Mastery behaviors.

[2]Observations obviously should be scheduled at times when the child will have sufficient opportunity to exhibit the behaviors to be observed. Mastery tasks are best observed if the child is allowed to do them reasonably independently. Social interactions can be observed whenever they typically take place in the particular setting.

10-minute period even if the child changed activities, wandered around the room, or began talking to the teacher.

Only tasks with a recognizable goal and recognizable steps which might be used in reaching that goal were considered candidates for the start of an observation. If it is not clear what a child is trying to do, the strategies used and estimate of success in completing the task are less relevant. For example, some art and construction projects met the criteria for being considered a Mastery task and some did not. Generally, the observer tried to get clearer examples of goal-oriented tasks for each child than these. If the observer could not determine the goal of a task (no matter what materials were being used), a Mastery observation was not started and the observer waited for the child to begin another task.

Animal Stalls Procedures

The basic instructions and setup for the Animal Stalls task have already been described (Section III) and were applied here. Each child was invited to come out into the hall co build something with blocks.[1] None seemed overly frightened, shy, or hesitant to come, and most were eager. All 10 children were given the 3-stall model of Version 3.

The task was administered by an Interviewer. A second person, the Observer, began recording as soon as the Interviewer had finished giving the instructions to the child. Recording was continued until the child either said s/he was finished (or "couldn't do any more," or "was tired," or "wanted to go back to the classroom"). Sometimes the child simply

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[1]Unlike most of the children in our sample, the children in this classroom were familiar with this kind of a request since they had worked with other researchers in this same hall area a number of times over the course of the year.

stopped work (or play) and just sat. In these cases, the Interviewer asked if s/he was finished. The child was then asked whether the copied structure matched the model, i.e., "does it look just like mine?" and the child's answer was recorded along with any reasons or comments offered.

Results

In the Animal Stalls task, half the children built an excellent or good replica of the 3-stall model; two children made structures in which model features were recognizable but which had significant omissions and substitutions; and three children built alternative structures which bore little or no resemblance to the model.

Table 8 presents the children's mean overall performance. As can be seen, there is a high proportion of On Task involvement in the group. The entire proportion of time in Explores is contributed by one child who built an alternative structure. As far as Mastery strategies are concerned, the percent of total positive strategies is very high (92%). Monitoring strategies were used most often for the group as a whole--52% of strategies were Monitoring strategies. Planning strategies were next most frequent (43%), and there was almost no Accommodation (5%). Children's strategies are also presented as a mean rate per minute to give some indication of the sheer amount of strategic behavior that the task generated. The total mean rate of positive strategies is 5.9 per minute during a mean period of five and a half minutes, indicating that the task elicits a fertile average strategic response from children (about one strategy every 10 seconds). Variability, however, is considerable.[1]

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[1]The measure of rate also was to provide a second common means (in addition to mean percent) of looking comparatively at strategic behavior in the classroom and in the prestructured Animal Stalls task. Rate is calculated by dividing number of strategies by total observation time.

Table 8

Substudy Animals Stalls:
Percent and Rate of Strategic Behavior Variables
(N=10)

Strategic Behavior Variables	$\bar{X}$		SD		Median		Range	
	%	Rate	%	Rate	%	Rate	%	Rate
Involvement								
Time Observed in Minutes	(5.5)		(1.50)		(5.0)		(3.75-8.0)	
Time On Task	92	-	26	-	100	-	19-100	-
Time Explores	08	-	26	-	0	-	0-81	-
Time Socializes	01	-	03	-	0	-	0-09	-
Completion Success Index (CSI)	59	-	-	-	71	-	0-100	-
Mastery Strategies								
Total Positive Strategies	92	5.89	13	3.71	100	6.80	60-100	0.90-12.00
Positive Planning	43	2.56	44	1.58	44	2.92	30-55	0.33-4.96
Positive Monitoring	52	2.96	50	1.90	50	2.92	42-67	0.39-5.88
Positive Accommodating	05	0.37	05	0.40	05	0.34	0-11	0-1.18
Child Age	(5.3)		-		(5.4)		(4.10-5.7)	

The teacher's rating of the children on Mastery competence is highly related to the strategic behavior variables observed in the Animal Stalls situation (see Table 9). The high rated children have the highest proportion and rate of positive strategies, and the highest CSI. The distribution of Planning, Monitoring, and Accommodating strategies across the three groups shows no clear pattern. The small size of this group and the rating of only one child as low may be contributing factors.

When we turn to look at their classroom behavior (see Table 10), the children as a whole spend more time in Social interactions (54%) than On Task in Mastery activities (33%). Most of their Social Involvement was in Noncollaborative rather than Collaborative activities (61% vs. 31%). The strategies they used were overwhelmingly positive, both in Mastery activities (97%) and Social interactions (73%). A high level of success is also associated with this general picture: 72% of Mastery tasks were completed successfully and 63% of positive Social strategies were successful. The major proportion of all these positive strategies was in Planning, both for Mastery (71%) and Social (50%) activities. Accommodation strategies were used much more often in children's Social interactions than in their Mastery activities (35% vs. 3%). Moreover, when children used negative Social strategies, they were far more likely to be negative Accommodations. However, they were not as successful as their positive Social strategies (43% vs. 63%).

The teacher's rating of the children's Mastery competence was also highly related to children's activities and strategies in the classroom. High rated children spent the most time in Social involvement and On Task in Mastery activities relative to the other children (see Table 11). While all children's Social interactions were mostly Noncollaborative, the difference

Table 9

Substudy Animal Stalls: Performance of Children Rated High, Medium and Low in Mastery Competence by Their Teachers (N=10)

	High (N=5)		Medium (N=4)		Low (N=1)	
Strategic Behavior Variables	%	Rate	%	Rate	%	Rate
N Minutes On Task	(5.0)		(5.5)		(1.5)	
Completion Success Index (CSI)	75	-	53	-	0	-
Total Positive Strategies	98	7.7	88	4.9	78	0.9
Positive Planning	48	3.5	37	1.9	50	0.5
Positive Monitoring	48	3.8	57	2.6	50	0.4
Positive Accommodating	04	0.4	06	0.4	0	0
Child Age	(5.4)		(5.2)		(5.1)	

Table 10

Substudy Classroom Observations:
Percent and Rate of Strategic Behavior Variables
(N=10)

Strategic Behavior Variables	$\bar{X}$		SD		Median		Range	
	%	Rate	%	Rate	%	Rate	%	Rate
Involvement								
Social Involvement	54	-	17	-	55	-	20-78	-
Collab. Interaction	31	-	26	-	28	-	0-69	-
Noncollab. Interaction	61	-	24	-	66	-	28-100	-
Socialize	08	-	09	-	04	-	0-28	-
Mastery Involvement								
Mastery On Task	33	-	12	-	36	-	06-48	-
Distracted	04	-	10	-	01	-	0-32	-
Explores	10	-	10	-	07	-	0-12	-
Attends Instructions	03	-	04	-	02	-	0-12	-
Other	05	-	05	-	04	-	0-16	-
Positive Mastery Strategies								
Task Completed Successfully	72	-	28	-	75	-	33-100	-
Total Positive	97	3.17	06	1.33	100	3.58	82-100	0.74-4.62
Positive Planning	71	2.20	09	0.93	70	2.55	59-86	0.63-3.13
Positive Monitoring	27	0.87	08	0.45	25	1.45	14-38	0.11-1.44
Positive Accommodating	03	0.10	03	0.13	02	0.03	0-08	0-0.37
Positive Social Strategies								
Successful Pos. Strategies[1]	63	-	22	-	70	-	30-92	-
Total Positive	73	1.54	23	1.19	82	1.16	35-97	0.37-4.24
Positive Planning	50	0.69	17	0.47	43	0.61	29-76	0.14-1.76
Positive Monitoring	15	0.35	10	0.50	14	0.20	0-38	0-1.61
Positive Accommodating	35	0.55	16	0.44	32	0.50	17-59	0.12-1.47
Negative Social Strategies[2]								
Successful Neg. Strategies[1]	43	-	43	0.02	50	-	0-100	-
Total Negative	27	0.39	-	0.32	18	0.33	-	0.11-1.16
Negative Planning	11	0.02	16	0.02	0	0	0-30	0-0.06
Negative Monitoring	22	0.07	20	0.06	22	0.07	0-63	0-0.16
Negative Accommodating	08	0.30	21	0.33	02	0.20	38-100	0.06-1.16

[1] Success was recorded where relevant.

[2] Negative strategies in Mastery activities were too infrequent to be included.

Table 11

Substudy Classroom Observations: Percent and Rate of Strategic Behavior Variables for Children Rated High, Medium and Low In Mastery Competence by Their Teachers

	High (N=5)		Medium (N=4)		Low (N=1)	
Strategic Behavior Variables	$\bar{X}$%	$\bar{X}$ Rate	$\bar{X}$%	$\bar{X}$ Rate	$\bar{X}$%	$\bar{X}$ Rate
Involvement						
Social Involvement	56	-	54	-	44	-
Collaborative Interaction	39	-	26	-	9	-
Noncollaborative Interaction	52	-	65	-	89	-
Mastery On Task	39	-	28	-	27	-
Positive Mastery Strategies						
Tasks Completed Successfully	83	-	67	-	33	-
Total Positive	98	3.5	100	3.4	82	0.7
Positive Planning	70	2.4	68	2.3	86	0.6
Positive Monitoring	28	1.0	28	0.9	14	0.1
Positive Accommodating	3	0.1	4	0.1	0	0
Social Strategies						
Successful Positive	80	-	74	-	35	-
Total Positive	79	2.0	59	1.1	38	0.6
Positive Planning	41	0.8	58	0.6	63	0.4
Positive Monitoring	21	0.5	07	0.2	16	0.1
Positive Accommodating	39	0.7	35	0.4	21	0.1
Successful Negative	79	-	0	-	63	-
Total Negative	21	0.3	41	0.3	62	1.2
Negative Planning	18	0	02	0	0	0
Negative Monitoring	21	0.1	29	0.1	0	0
Negative Accommodating	61	0.2	70	0.2	100	1.2

in proportion of time spent in Collaborative and Noncollaborative activities is much smaller for high rated children than it is for the medium and low rated children.

The children rated high in Mastery competence were also highest in the proportion and number of positive Social strategies they used in the classroom. Their Social strategies were the most successful and, while they used the smallest total proportion of negative Social strategies, their negative strategies were more successful (Table 11).

As far as Mastery strategies in the classroom are concerned, differences are less clear among the three groups. Positive strategies were used almost all the time, though high rated children's Mastery strategies more often led to successful task completion.

These trends are very similar to those for children rated high, medium, and low in Social skills (Table 12). High rated children spent more time in Mastery On Task activities and in Social interactions in the classroom than did medium and low rated children, and they were less often involved in Noncollaborative interactions. The high rated children also used the greatest proportion of positive Mastery and Social strategies with the greatest degree of success in each, and were especially high in their relative use of Social Accommodation. They used fewer negative Social strategies than the other groups but, again, their negative strategies were more successful than those of the other children. Some of the similarities in these patterns can be attributed to the fact that four of the ten children were given the same rating by the teacher on Mastery and Social skills.

Comparison Across Settings

In comparing children's strategies across settings, the focus is on Mastery strategies only in the structured (Animal Stalls) situation, and on both Mastery and Social activities and strategies in the classroom.

Table 12

Substudy Classroom Observations: Percent and Rate of Strategic Behavior Variables for Children Rated High, Medium and Low in Social Competence by Their Teachers

	High (N=3)		Medium (N=4)		Low (N=3)	
Strategic Behavior Variables	$\bar{X}$%	$\bar{X}$ Rate	$\bar{X}$%	$\bar{X}$ Rate	$\bar{X}$%	$\bar{X}$ Rate
Involvement						
Social Involvement	71	-	52	-	39	-
Collaborative Interaction	46	-	39	-	05	-
Noncollaborative Interaction	47	-	54	-	85	-
Mastery On Task	40	-	28	-	35	-
Mastery Strategies						
Tasks Completed Successfully	89	-	67	-	61	-
Total Positive	100	3.9	98	3.1	94	2.6
Positive Planning	69	2.7	71	2.2	71	1.8
Positive Monitoring	30	1.1	26	0.8	24	0.7
Positive Accommodating	02	0.1	03	0.1	05	0.2
Social Strategies						
Successful Positive	75	-	73	-	38	-
Total Positive	90	2.1	76	1.9	52	0.7
Positive Planning	37	0.7	53	0.9	58	0.4
Positive Monitoring	12	0.4	22	0.5	08	0.1
Positive Accommodating	52	1.0	25	0.4	33	0.3
Successful Negative	50	-	43	-	31	-
Total Negative	10	0.2	24	0.3	48	0.7
Negative Planning	13	0	13	0	02	0
Negative Monitoring	16	0	30	0.1	18	0.1
Negative Accommodating	72	0.1	57	0.2	80	0.6

In the Animal Stalls situation, the child is required to focus continuously on a novel Mastery task. In the preschool classroom, there is not only a known and predictable sequence of activities, but children can often choose whether or not to work together with someone else and the nature of the activity, whether undertaken alone or with others, is itself often self-selected. It is not surprising, therefore, that these children's Mastery On Task involvement comprises a much higher proportion of the observation in the prestructured situation than in the classroom (see Table 13). In the classroom, the children spent the major part of their time in Social interactions.

As far as the use of strategies is concerned, Mastery strategies were almost wholly positive in both settings (92% Animal Stalls, 97% classroom), and positive Social strategies were also high (73%). In the Animal Stalls situation, positive Monitoring strategies were the most frequent, whereas in the classroom, Planning strategies occurred most often in both Mastery and Social activities. Positive Accommodating strategies were hardly seen in Mastery activities in either setting, but accounted for more than one third of positive Social strategies (Table 13).

The majority of the children's positive strategies were successful in both kinds of activities and in both settings. However, the highest degree of success was in Mastery strategies in the classroom (72%), perhaps because such strategies are more likely to be tied to familiar or self-selected tasks, and are not accompanied by the stress that might attend the structured task and that can affect children's Social interactions. Children's positive Social strategies were successful somewhat less often (63%) than their Mastery strategies; and the least successful positive Mastery strategies were those in the Animal Stalls (59%).

Table 13

Substudy Animal Stalls and Classroom Observations:
Percent and Rate of Strategic Behavior Variables

Strategic Behavior Variables	Animal Stalls		Classroom Observations: Mastery Activities		Classroom Observations: Social Interaction	
	%	(rate)	%	(rate)	%	(rate)
Involvement						
Mastery On Task	92	-	33	-	-	-
Social Interaction	-	-	-	-	54	-
Collaborative	-	-	-	-	31	-
Noncollaborative	-	-	-	-	61	-
Positive Mastery or Social Strategies						
Success	59	-	72	-	63	-
Total Positive	92	6.0	97	3.2	73	1.7
Planning	43	2.6	71	2.2	50	0.7
Monitoring	52	3.0	27	0.9	15	0.4
Accommodating	05	0.4	03	0.1	35	0.6
Negative Social Strategies[1]						
Success	-	-	-	-	43	-
Total Negative	-	-	-	-	27	0.4
Planning	-	-	-	-	11	0
Monitoring	-	-	-	-	22	0.1
Accommodating	-	-	-	-	68	0.3

[1]Only Social Negative Strategies were frequent enough to be included.

Interestingly, the rate of strategies the children generated differs considerably across the two settings, and in Mastery as opposed to Social activities. The highest number of positive strategies occurred during the Animal Stalls task, and the lowest during children's Social interactions in the classroom. While the proportion of Mastery strategies is about the same in both settings, the rate in the Animal Stalls situation is almost double that of Mastery strategies in the classroom, implying that the structured task succeeds in challenging and tapping children's strategic capabilities more directly and concentratedly.

Negative strategies were observed in children's Social interactions but hardly at all in their Mastery activities in either setting. Negative Accommodating strategies were by far the most frequent and accounted for two thirds of all negative Social strategies. These children's negative Social strategies, however, were less successful than their positive strategies.

Discussion and Future Directions

In considering these two studies side by side, there are striking similarities. This speaks well for our measures, considering the substantial differences in the two populations and in task characteristics. The sub-study population was relatively homogeneous. The children were close in age (within a 9-month span); they were of the same ethnic group; they came from the same classroom and had the same teacher; and they were all given the same (3-stall) task. The larger study represents a much broader sampling with respect to age, ethnicity, geographic area, the kinds of programs the children attended (public and private preschools and schools), and the version and complexity of the task they were given.

In spite of these differences, in both sets of data strategy use was associated with level of performance, as were the ratings of teachers. Both

sets of data show a clear hierarchy in the frequency of Mastery strategies used in the Animal Stalls, and in each sample there was a notably low incidence of negative strategies and of Accommodation strategies. The main discrepancy between the findings of the two studies is in the pattern of frequency of Planning and Monitoring strategies. In the larger study, Planning strategies were most frequent, followed by Monitoring and Accommodating strategies. In the substudy Monitoring occurred more often and Planning was second most frequent in the structured situation. However, Planning strategies were dominant in Mastery as well as in Social activities in the classroom. Both Planning and Monitoring strategies are critical for performance in both Mastery and Social situations. Verifying the patterns of dominance will require further work.

Strategic behavior, like competence, is a concept of broad scope. Children's strategies are an important part of their everyday behavior and ideally should be sampled across a broad range of contexts. What we would expect, on the basis of our definition of strategic behavior and from our experience with the CSAS and Animal Stalls is both commonality and specificity. That is, strategies can be expected to cut across different contexts, but their pattern, incidence and range will vary according to specific contexts. The relatively high incidence of Social Accommodation strategies in the classroom and the low incidence of Mastery Accommodation strategies in the classroom and in the Animal Stalls, illustrates this point. Particular aspects of different contexts may increase or decrease the likelihood of certain strategies. In the classroom, children spent far more time in Social interactions than in Mastery tasks, creating differential opportunities for use of different strategies. This may be particularly characteristic of life in preschool. The relatively high incidence of negative

Accommodation strategies in their Social interactions (as opposed to its low incidence in their Mastery tasks) is an indication that these young children are still learning how to live together in a group. There was good evidence that they were learning this well since their strategies in general were mostly positive. One might find a different pattern at the beginning of the school year, when children are entering preschool for the first time.

A next step in observing and understanding children's use of strategies--and one that is vital for clarifying the interplay of Social and Mastery strategies--is to develop a task situation in which two children can participate in a common task. Such a situation would give an opportunity to observe children's collaborative and noncollaborative interaction in a controlled Mastery context, and would provide a comparable frame and focus for the use of both Mastery and Social strategies.

We have found the relationship between strategic behavior and developmental capacity interesting and difficult. If the measures are to go beyond merely gauging the degree of children's socialization in school, it is necessary to disentangle perceptual, conceptual and other cognitive issues from the pressure of the Animal Stalls situation itself. Administration procedures are also important here since both Interviewer and child might think the child understands the task when the child only partly understands it. For example, he or she might not understand what we mean by building one that is "just like mine."

It is true that building with blocks is an ordinary activity for young children. Indeed, many of the constructions made by children of the age range sampled are sometimes extremely elaborate. A number of knowledgeable people looked at our structures before and during trials. None thought them

too difficult for children of these ages. The constraints of the task situation are relevant here. The directive to make a replica is not one that young children are familiar with, and the implication of accuracy that it carries is not consonant with what preschoolers are used to. Perhaps also the familiarity of materials coupled with the unfamiliar constraints made it difficult for some children. Observing the difficulties some children had with the task enhanced our awareness of its complexity and the broad range of capabilities that effective performance demanded. Developmental variables obviously play a significant role in children's competence in this task. But the relationships are neither simple nor clearcut. We have seen young three-year-olds skillfully building the 3-stall model, and five-year-olds who cannot build the 2-stall. (Perhaps it should also be noted that no stereotypical expectations about differences between girls and boys in a task that required building with blocks were confirmed. Girls were just as likely as boys to build excellent replicas; boys just as likely as girls to founder.)

Perhaps it is relevant to the developmental issue to note that strategies can be taught. They can be taught as specific strategies (e.g. looking for the edge pieces in doing a puzzle), or as more general guides (e.g. looking at previous questions answered in a workbook to solve a current problem; listening to the person who is telling you what to do next; taking turns). We have observed teachers who took many occasions to teach children strategies, and many who seemed almost to stand in the way of the child's learning or discovering strategies for himself. Some teachers were more likely to take over and demonstrate the right way, to show the child how to lace the shoe by doing it themselves, often without any words. Teachers may be more attuned to teaching social strategies to young children

since, as we have already noted, learning to live in a group is one of the primary tasks for the young child and promoting this learning is a primary aim of the preschool and kindergarten. Thinking in terms of Mastery strategies is less familiar for teachers.

Such considerations remind us that an original goal of the present project was to provide measures of program impact. If the measure of children's strategic competence is to serve as a way of gauging the effects of educational programs, it would be productive to observe the extent to which strategies are directly taught by teachers. In our project we did not observe and evaluate the different Head Start programs. But our informal observations and conversations with teachers, directors and educational directors forcefully confirm the variation among programs in clarity of educational goals, psychological sophistication of teachers and aides, and the richness of the curriculum. We are not suggesting that these differences can be tied to particular outcomes of particular children on the construction task. It would obviously require a much more comprehensive array of measures, as was originally intended in the national project, to be able to make any statements connecting children's performance to program quality.

Further directions in our work on children's strategies would address the three measures used: the CSAS, Animal Stalls and teacher ratings. Further development of the CSAS would include clarifying definitions and specifying directives about the application of some codes. This would be a prerequisite to further analysis of patterns of dominance of different strategies. Some strategies that occur infrequently should perhaps be collapsed (for example, some of the verbal Planning and Monitoring strategies). In addition, developing a two-person task could lead to the creation of some new categories that focus on simultaneous Social/Mastery strategies.

As far as the Animal Stalls task is concerned, our work so far has established some of the directions future efforts should take. As already stated, we need to have a better understanding of developmental issues in further task development. To have three kinds of models, varying in the number of stalls, is a cumbersome way of dealing with developmental level. On the whole, the level of task difficulty tended to be too high rather than too low. A better approach is to develop a single version (perhaps consisting of three stalls) and to vary the complexity in that single structure.

While teacher ratings pose all kinds of well-known difficulties, the teacher rating form can also be improved--by providing the teacher with more concrete and specific indicators. This would also make it more feasible to pool ratings from different teachers in different settings. Discussions with teachers could guide this work.

Our goal in this project was to develop measures of children's strategies. The Animal Stalls task provides a situation that evokes strategic behavior in a dense and focused way. The CSAS provides a clear set of indicators for observing and codifying strategic behavior. These two tools are coherently integrated with the constructs of our hypothetical model, and their usefulness, as reported here, supports the conceptual framework. The richness of the data, as well as the provocative questions they raise, testify to the importance of understanding children's strategies in context.

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APPENDIX A

CHILDREN'S STRATEGIES ASSESSMENT SYSTEM (CSAS)

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CHILDREN'S STRATEGIES ASSESSMENT SYSTEM (CSAS)

INTRODUCTION

The Children's Strategies Assessment System is being developed as a tool to assess young children's competence in social interactions and in material tasks. The focus is on the strategies children use in these two domains, that is, how they organize their behavior in purposeful activities with others and with objects.

The CSAS is largely based on Bronson's concept of "executive skills" and on her classroom observation measure, the "Executive Skills Profile" (1975, 1978, 1981, 1982). The CSAS has been developed with the close collaboration of Bronson. It extends the Social and Mastery strategies of Bronson's earlier work, integrates these within a unifying theoretical base (see Shapiro, Wallace, Desir & Fulani, 1981), and includes strategies which have a negative as well as positive aspect.

The system is for use with children aged three through six. Its title as an observation system means that it can be used both in the "natural" setting of the preschool and primary school classroom, and in a structured situation where a child is given a specially designed task (or standard measure) in an individual session, or where two or three children are asked to collaborate in a task. The procedures and categories described in the following sections refer to observations in the natural setting and to a specially developed task called Animal Stalls. The Animal Stalls task requires an individual child to replicate a block construction from a model. The model is a table-block structure consisting of "stalls" with miniature animals and hay bales, such as might be found on a farm or in a barn. Three variations of the model are used, depending on the developmental level of the child. As stated, however,

the CSAS is a system which may also be used with other prestructured tasks (as well as in the classroom), and should be understood as such in this document.

OVERVIEW OF CONSTRUCTS AND CATEGORIES

In the CSAS, children's strategies in purposeful social interactions and in goal-oriented tasks with objects are grouped in terms of five theoretical constructs: INVOLVEMENT, PLANNING, MONITORING, ACCOMMODATION, and OUTCOME. Each of these is briefly described below:

Involvement: The nature of the child's absorption in an activity.

Planning: How the child manages, organizes, and anticipates his/her actions and those of others.

Monitoring: Checking and commenting on one's own work and that of others.

Accommodation: The child's adaptation to the demands of the social and material situation in context.

Outcome: The completion, success, and evaluation of an activity.

Children's strategies are recorded in different categories under each of these five constructs. Social strategies are differentiated from strategies with objects, or "mastery" activities as Bronson has called them, though an overlap is obviously possible (e.g., two children working on a puzzle).

Social Strategies: These are the strategies that occur when the child is interacting in purposeful activity with one or more other people.

Mastery Strategies: These are the strategies a child uses when engaged in a purposeful task with objects. The task may be a solitary activity or one undertaken with one or more others. It is often a problem-solving activity. It always has a known or observable goal whose achievement in terms of completion and success is observable.

The social and mastery strategies recorded in the CSAS are presented as a list below, grouped according to the five constructs. The list provides an overview of all categories of strategies. Each is also described in detail in a later section, together with examples.

LIST OF CONSTRUCTS AND STRATEGIES

Construct	Strategies	
	Social	Mastery
INVOLVEMENT	Collaborative Interaction Noncollaborative Interaction Socializing	On Task Explores Distracted Attends to Instructions
	Involved Watching Not Involved Other	
PLANNING	*Physical Setup Predicts Outcome Suggests Activity/Demonstrates/ Directs Assigns Roles or Resources Invokes Rules *Request to Join	*Physical Setup Predicts Outcome Verbalizes Rules or Task Requirements *Uses Systematic Approach
MONITORING	Monitors Others *Describes or Comments on Others *Describes or Comments on Self	Checks Instructions or Model Describes or Comments on Work Comments on Ease or Difficulty of Task
ACCOMMODATING	*Shares *Trades or Trades Off *Takes Turns *Promises/Bribes *Helps *Joint Effort or Combines Resources Hostile Force Resists Rules or Teacher Asks Social Help	*Revises Action or Takes New Approach Fine Tunes Asks Mastery Help
OUTCOME		
Completion		Completes Incomplete Not Applicable
Success		All Perfect Nearly Perfect About Half Less than Half Right
Evaluation	Praised Criticized Corrected Ignored	

*Strategies with an asterisk have both positive and negative aspects.

PROCEDURES

The CSAS provides both a time and event sample of the behaviors recorded. Time is recorded in 15-second intervals. Discrete events can occur more than once within the intervals, but activities which continue over time are calculated according to the nearest 15-second interval.

A sample observation sheet is appended to this document. Each horizontal line on the sheet represents a 15-second interval. Double horizontal lines represent 1-minute intervals and are included for ease of discrimination in recording. Each observation sheet contains space for five minutes of observation. Continuous events are recorded by placing appropriate marks or letters (described below) in each of the intervals in which the behavior occurs; discrete events are recorded in the appropriate time slots by marks or letters, as indicated in the instructions for each category.

The observation sheet is divided into six parts: CONTEXT, INVOLVEMENT, SOCIAL STRATEGIES, MASTERY STRATEGIES, and OUTCOME. The CONTEXT section is for a brief written narrative record of the child's ongoing activities that are related to the recorded categories. Specific actions, interactions, and the objects of interactions are noted here. At the end of each 10-minute observation period or observation of a structured task, a more expanded and detailed description of the behaviors recorded is written by the observer on the back of the observation sheets (see attached sample).

The INVOLVEMENT section categories indicate the child's capacity to be absorbed in purposeful activity with others and with material objects. The categories show the type and level of these activities, as well as the amount of observation time the child spends in nonpurposeful activities.

The SOCIAL STRATEGIES section includes categories for social Planning, Monitoring, and Accommodating strategies. Where appropriate, these categories are recorded with a plus (+) or a minus (-) depending upon whether the child uses the strategy in a positive or a negative way. The social strategy categories are also scored for success or failure where relevant. "Accepted" (A) is recorded if a strategy is successful. "Rejected" (R) or "Ignored" (I) is recorded if the strategy is not successful.

The MASTERY STRATEGIES section includes categories for mastery Planning, Monitoring, and Accommodating strategies. These categories are also recorded with a plus (+) or a minus (-) where relevant.

The help-seeking categories (Asking Social Help, Asking Mastery Help) under Accommodation are recorded in terms of the child's success in obtaining help (Accepted=A, Rejected=R, and Ignored=I), and the person from whom help was sought is also noted (Teacher/Adult=T, Peer/Male=PM, or Peer/Female=PF).

The final, OUTCOME, section includes the degree of successful completion achieved in mastery tasks, and categories for any evaluation by others of the child's social or mastery behaviors (solicited or unsolicited). Evaluation by Others categories are recorded according to the person doing the evaluating (Teacher/Adult=T, Peer=PM or PF).

CSAS CATEGORIES

The categories are described in the order in which they appear on the observation sheet. The first section of the sheet--CONTEXT--is for notes describing the human and physical behavior settings (where the activity takes place, who was there, etc.), or specific behaviors such as the order in which the child does particular parts of the Animal Stalls task.

INVOLVEMENT

Involvement categories are not mutually exclusive so that a child can be involved in an activity that includes both social and mastery activities at the same time (playing Checkers, for instance). Every 15-second time interval must have a mark (X) in at least one of the involvement categories.

SOCIAL INVOLVEMENT CATEGORIES

Collaborative Interaction (Involvement)

The observed child is engaged in a clearly organized interaction with one or more others, such as complex sociodramatic play with assigned roles, or games with roles. The interaction is organized in such a way that the roles or activities of the child are interrelated with the roles or activities of the other child or children. The category is analogous to what is conventionally called cooperative play.

Examples of Collaborative Interaction (Involvement)

- The child is playing "house" with another child. S/he takes the role of the "mother" and the other is the "father." Their activities are organized according to their roles, and the children are cooperating in "cleaning house" or "feeding the baby."

- Two children are playing Candyland (Checkers, Scrabble, etc.) together. The observed child takes turns and plays by the rules, often discussing the moves with the other child. (This activity would be recorded as both Collaborative Interaction and On Task since it involves a task as well as a social interaction.)

Noncollaborative Interaction (Involvement)

The observed child is interacting with others, but in a less organized way. This category includes parallel and associative play and any social interaction that is not defined as Collaborative or Socializing (see below).

Examples of Noncollaborative Interaction (Involvement)

- The child is building with Lego near another child who is also constructing something. The child talks about his/her construction to the other child, not taking account of the fact that the other child is deeply absorbed in his/her own activities, or is actually talking too.
- The child is playing with playdough at a table with another child. They talk to each other but there is no organized "game" with the materials nor any planned cooperative effort. Their comments to each other tend to be assertions and counter-assertions rather than a discussion or conversation.
- The child is washing a doll in the doll corner with another child "cooking" in the background. Both children talk about what they are doing but do not take roles or interact in any organized way.

Socializing (Involvement)

This is recorded when the child carries on a conversation or discussion with another person (child or adult) with the primary intent of exchanging information or comments in a reciprocal way. The child listens and responds to the other person over a 15-second (or greater) period.

Examples of Socializing (Involvement)

- The child discusses plans for summer camp with another child.
- The child discusses a TV program with another child who also saw it.
- The child discusses with other children the trip they have just taken to the zoo.

MASTERY INVOLVEMENT CATEGORIES

A mastery task is a goal-oriented or problem-solving activity in which the use of effective strategies is apparent and important and which can be recognized as successful or unsuccessful.

Good examples of preschool mastery tasks are puzzles, matching and sorting tasks, counting tasks, prereading or number worksheets, workbooks or mimeographs, writing letters or numbers, and (generally) any "academic" task. In the primary grades, the usual tasks assigned to children (math, language arts, and science tasks) are mastery tasks.

Art and construction tasks may be recorded as mastery tasks as long as it is clear what the child is making and as long as the product, and the steps used in producing it, can be recognized and judged as successful or unsuccessful.

Tasks for which no goal is observable and which, therefore, do not include recognizable steps toward a goal should be scored as Explores (see below).

On Task

This is recorded when the child is involved in a mastery task, that is, in a task with a clearly discernible goal.

Examples of On Task

- The child is absorbed in practicing lacing a shoe and is working out which end of the lace goes in each hole.
- The child is steadily building a block construction in collaboration with another child. (Note that Collaborative Interaction should also be recorded in this instance.)
- The child is concentratedly writing in a workbook.

Explores

This refers to a clearly focused involvement with materials or some aspect of the physical environment where a clear goal is not discernible. The younger the child, the more exploratory the involvement with objects or materials tends to be. Often this means that, since a plan or goal is not known, success or the lack of it are also unknown. Children's exploration with materials is primarily one of "tinkering" with the physical

properties of objects and seeing what can be done with them. Even materials that are typically used for mastery tasks (materials designed with an inherent goal, like puzzles) are used in an exploratory way by some children. The judgment about which involvement category to use is always based on the child's activity with the material, not on the nature or purpose of the material itself.

Examples of Explores

- In the preschool, play with sand, water, or clay is often exploratory. Older children may also explore with these materials, though they are likely to do so less often.

- Play with art or construction materials can be either Explores or On Task at any age, but is more likely to be the former, the younger the child.

Distracted

This category is relevant to On Task and Attends to Instructions only. If the child's attention wanders in the midst of any other type of involvement, the lapse should be coded Not Involved (see below). Distracted is recorded when the child's attention wanders from the mastery task s/he is doing or from the instructions being given. The result of a distraction may be a change in focus (leaving the ongoing task unfinished) or a return to the task (or instructions).

Examples of Distracted

- The child stops working on the mastery task s/he is doing when a visitor comes into the room. After watching the visitor for a while, s/he looks around the room for another minute or two before getting back to work.

- The child seems to "lose hold" of the task at hand without turning attention to any clear alternative. Sometimes s/he simply stares off into space.

- The child has been working on a task but has reached a difficult part and, after a brief effort to get through it, starts to draw scribbles or doodles on the side of the work page. S/he continues this until the teacher notices, and says to get to work.

NOTE: Distraction is not recorded when the child simply glances up, as if monitoring other events in the room, and immediately returns to the task. Distraction is also not recorded when the child is interrupted by the teacher or another child or by some other legitimate demand for his/her attention.

Attends to Instructions

This is recorded when the child is being specifically told how to proceed in a task or other activity. The instructions can take place either individually or in a group, but it must be clear that they are intended for this child (as well as others, perhaps). If the child listens to instructions intended for another child or group, Other Involvement (see below) is recorded, unless it is clearly a way of being distracted from his/her own task.

Examples of Attends to Instructions

- The teacher has given the whole class worksheets and is explaining to the group how they are to be done.
- The teacher has given the child a special assignment and is explaining to him/her alone how it is to be done.
- The child is having difficulty with a task and has just asked for help from the teacher, another child, or from the experimenter in the Animal Stalls task. S/he listens to the explanation.

OTHER INVOLVEMENT CATEGORIES

Involved Watching

This category is recorded only when the child is watching others in a social or mastery activity in an intent, focused way. Looking at an activity for a few seconds is not counted as Involved Watching.

Examples of Involved Watching

- The child stares for an extended period at another child who is cutting and pasting for a collage.
- The child watches a group of children intently in a role play sequence, as if preparing to try to join them.

NOTE: Involved Watching is recorded as a "W" in the appropriate time slot under the category of activity the child is watching.

Not Involved

This is recorded when the child wanders aimlessly about the room, drifts from one brief encounter with people or objects to another without real engagement, or simply sits, stands, or lies down without doing anything. Sometimes children make brief comments to others as they drift or wander about, but no focused social or mastery activity is taking place.

Examples of Not Involved

- Other children are working on an assigned mastery task, but the observed child has not begun. S/he sits staring out the window or watching others briefly or fiddling with an eraser. (The same behavior after the child had begun the task would be scored Distracted.)

- The child is wandering around the room as if looking for something to do, sometimes briefly watching others, but never really engaging in anything.

Other

This includes all types of involvement which cannot be recorded in any of the above categories. Gross motor activities, solitary fantasy play, and solitary eating can be noted here, as well as waiting in line (unless this is also a social activity with talking on the part of the observed child).

Examples of Other Involvement

- The child repeatedly climbs a small indoor jungle gym and slides down the slide.

- The child plays alone with a small dollhouse, moving toy figures about in a fantasy drama.

- The child rides around in circles on a toy tricycle.

SOCIAL STRATEGIES

Social strategies are categorized, where appropriate, with a (+) or (-) depending upon whether they are used positively or negatively, and with A (Accepted), R (Rejected), or I (Ignored) when this is relevant. In order to save space on the sheet, if A, R, or I is noted, the strategy is assumed to be positive unless marked (-). More than one strategy may be marked in a single time slot if more than one occurs. Two strategies--Hostile Force and Resists Rules--are always coded as negative.

SOCIAL PLANNING STRATEGIES

* Physical Set-Up (Social)

This is a preparatory strategy which involves the physical organization of materials or a play space before or during a social interaction. It shows planning or foresight. The negative of this strategy is recorded when the lack or inadequacy of preparation is detrimental to the interaction.

Examples of Physical Set-Up (Social)--Positive (+)

- The child lays out the dress-up clothes that s/he and a friend will wear in a sociodramatic play sequence.
- The child finds and sets up the materials for a Candyland game which s/he and two others will play.

Example of Physical Set-Up (Social)--Negative (-)

- The child has set up a board game to play with another child, but in an area which also serves as a passageway in the classroom, making for constant interruption and noise.

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*As noted (see p. 4), strategies with an asterisk have positive and negative aspects.

Predicts Outcome (Social)

This is recorded when the child makes a verbal prediction or acts in such a way as to indicate that s/he looked ahead to what the consequences of a social action or social situation might be.

Examples of Predicts Outcome (Social)

- The child notes that his/her team will win if a certain child is on it because that child is a very good player.
- The child says to a friend that a third child will be sad if the friend does not invite him/her to the birthday party.

Suggests Activity/Demonstrates/Gives Directions (Social)

The child makes specific suggestions for beginning an activity, or suggests a new direction for or elaboration of an ongoing activity. The child demonstrates how something should be done or gives specific directions about what to do or how to do it. These demonstrations or directions are organized and are social strategies to organize others. They are not just unrelated demands for others to obey, but indicate the presence of a plan.

Examples of Suggests Activity/Demonstrates/Gives Directions (Social)

- The child generates an idea to begin a social play activity: "Let's play house," or "Let's be princesses in a castle and the jungle gym is the castle," or "Let's play Checkers."
- The child makes followup suggestions during social play: "This can be a fort for the soldiers," or "This will be our house and this mat can be our bed," or "Now let's feed the baby."
- The child demonstrates: "This is the way the robots should walk when they come into our spaceship," or "This is how you do the cutout decorations for the party."
- The child directs: "The bad guys should climb over this ladder to get into the fort," or "This is the way you can make the long blocks stay together."

Assigns Roles or Resources (Social)

This is recorded when the child assigns roles, parts, teams, "sides," or material resources in role play or in other games.

Examples of Assigns Roles or Resources (Social)

- The child suggests: "You be the father and you be the baby and I'll be the mother," or "You two should be firemen and come to save us."

- The child says: "You can have the red checkers and I'll take the black ones," or "You can take the dress-up hat and I'll have the high-heeled shoes."

- The child suggests: "You make the barn and I'll get the animals," or "You bring the water and I'll get the bowls for the 'soup.'"

Invokes Rules (Social)

This is recorded when the child either appeals to rules to facilitate social interaction or states the rules of interaction in a game. The child may invoke the ground rules of the environment, recite the rules of a game, or make up rules to order the activities in a game.

Examples of Invokes Rules (Social)

- The child reminds another: "We have to clean this up before we have juice," or "We (you) are not supposed to go out there without a teacher."

- The child states: "The one who gets to the red line first wins, okay?" or "In this game the person with the red marbles always takes the red space."

- The child notices that someone is not making a fair move in a Checkers game and says: "You're not allowed to move that way."

* Request to Join (Social)

This is recorded when there is a simple request to join others in some activity. The negative aspect of this strategy is a refusal to let others join in an activity.

Example of Request to Join (Social)--Positive (+)

- The child asks: "Can I play?" or "Can I play with you?" or "Will you play with me?" or "Can I do it too?"

Example of Request to Join (Social)--Negative (-)

- The child says to another (who is requesting to join): "You can't play with us," or "I don't want to play with you."

SOCIAL MONITORING STRATEGIES

Monitors Others (Social)

This is recorded when the child is closely watching the behavior or responses of another (or others) within an ongoing social interaction of which the child is a part. The child appears to be monitoring the responses of others to his/her own directions or watching the progress of interaction in order to gauge what to do next in the interaction. Sometimes the child seems to be trying to get ideas from others or to compare his/her own behavior or product with theirs. (Watching others when not in interaction with them is not scored here but is scored as Involved Watching [W] in the appropriate time and category slot.)

Examples of Monitors Others (Social)

- The child has been teaching another to play Checkers and carefully checks the moves the other is making (for accuracy).
- The child is directing several children in the building of a rocket ship with blocks. S/he keeps careful tabs on who is doing what and makes pertinent comments so that the building proceeds according to the play s/he has in mind.
- The child is part of a group playing hospital. S/he watches carefully so that s/he can play the role assigned to her/him effectively.

* Describes or Comments on Others (Social)

This is recorded when the child takes verbal note of another person's actions, feelings, appearance, or personality characteristics, showing s/he has or is "monitoring" the other person. The remarks must refer to an ongoing or recent perception; if the child comments on something in the past, the observer cannot be certain that the child actually noticed the event, or was told about it by someone else, or invented it. Friendly or neutral comments are recorded as (+) and negative comments as (-).

Examples of Describes or Comments on Others (Social)--Positive (+)

- The child notices two children playing together who seldom have before and says, "Nona and Susan are friends now."
- The child says: "Raphael isn't here today; is he sick?" or "Jamie always cries when his mother leaves" (noticing that he is crying now).
- The child notes: "Anna is drawing a rabbit," or "Michael is building a very tall tower," or "Roberto is watering the plants."

Examples of Describes or Comments on Others (Social)--Negative (-)

- The child tells another: "You're fat."
- The child notes: "The teacher doesn't notice when we copy [work from others] so I'm going to do it."
- The child says: "Jamie is a crybaby."

* Describes or Comments on Self (Social)

This is recorded when the child verbally notes his own actions, feelings, appearance, or personality characteristics in relation to a social situation. As above, the remarks must refer to an ongoing or recently occurring self-perception for plausible evidence of self-monitoring. Negative self-monitoring implies a negative self-evaluation rather than the perception of negative feelings such as "I feel sad," or "I feel mad."

Examples of Describes or Comments on Self (Social)--Positive (+)

- The child says: "I'm so happy today because we are going to the zoo," or "It makes me so sad when Rick won't play with me" (This is not a negative strategy but only a comment on an unhappy feeling).
- The child notes: "I ate the most at snack today."
- The child says: "I'm the only one wearing shorts today," or "My sneakers are the dirtiest."

Examples of Describes or Comments on Self (Social)--Negative (-)

- The child says: "I'm so bad at this game," or "I'm not good at catching balls."
- The child says: "My hair is so ugly," or "I'm too fat" (thin, tall, short, etc.).

SOCIAL ACCOMMODATING STRATEGIES

Social Accommodating Strategies are sometimes initiated by others, that is, the observed child may be asked to share, help, take turns, etc. When the observed child initiates the strategy, the (+) (A, R, or I is not relevant) is circled: + to distinguish strategies initiated by the observed child from those the child responds to. When the child resists or rejects an accommodating strategy initiated by someone else, a negative strategy (-) is recorded, as described below. Unreasonable demands to accommodate from another child, or from an adult, are not scored as negative strategies if the observed child refuses. It is usually easy to distinguish unreasonable from reasonable demands. If in doubt, the observer should not score a negative strategy.

* Shares (Social)

This is recorded when the child suggests or otherwise initiates sharing resources (toys, food, clothes, roles, etc.). The goal may be to "get into the game," to show friendliness or affection, or to resolve a conflict. If the child is asked to share by someone else and s/he agrees, circle the (+) as shown above. If the child refuses a reasonable request for sharing, the negative strategy (-) should be recorded.

Examples of Shares (Social)--Positive (+)

- The child says: "Everybody can have some of my candy" (shares own resources), or "Let's share the big blocks" (to resolve a conflict since there has been an argument about who is to control them), or "We can both use some of the Lego" (to get another child to play).
- The child is asked: "Will you share your crayons with Jimmy?" or "Please, may I have one of your peanuts?" and the child agrees.

Examples of Shares (Social)--Negative (-)

- The child says, when asked: "Nobody can have any of my candy" (though s/he has a great deal).
- Another child suggests sharing the big blocks which the two have been arguing over and the observed child refuses.

- Two children are coloring and the observed child has the only working pink marker. S/he refuses to share it when asked.

NOTE: Sharing or refusing to share need not be verbal. Children may offer food, toys, etc., without words, or may refuse to share without words.

* Trades or Trades Off (Social)

This is recorded when the child suggests or otherwise initiates or agrees to a reciprocal exchange of materials, position (changing places or "sides"), or roles. The negative of this strategy is a refusal of another's reasonable request. Unjust or unequal trades are not considered reasonable.

Examples of Trades or Trades Off (Social)--Positive (+)

- The child suggests: "Now you can have my truck and I'll play with your airplane," or "Now can I be inside the fort and you be outside," or "I'll let you have the best dress-ups if you let me be the mother," or "I'll trade you a flower sticker for a star sticker."

Example of Trades or Trades Off (Social)--Negative (-)

- The child refuses a reasonable suggestion by another child to exchange one puppet for another. (Although the child is within his rights to refuse such an offer, the refusal shows a lack of social accommodation to the other child in the situation observed.)

* Takes Turns (Social)

This is recorded when the child suggests or initiates taking turns, or suggests waiting for one's turn, or agrees to someone else's request to take turns. The negative of this strategy is recorded if the observed child refuses to agree to someone else's reasonable request to take turns.

Examples of Takes Turns (Social)--Positive (+)

- The child says: "After you, can it be my turn to hold the rabbit?" or "You can play with the balloon first, then give it to me, okay?" or "First I'll be the leader, then you can be the leader," or simply "My turn next."

- The child is taking turns (with or without words) in a play situation or a structured game situation (such as Checkers or Candyland).

- The child is asked to take turns or to wait for a turn (by the teacher or another child) and s/he complies.

Examples of Takes Turns (Social)--Negative (-)

- The child has had a long turn on a favored bicycle and others are waiting. Another child asks to have a turn, and the child resists or refuses.

- The child does not wait for his/her turn in a play or game situation, takes an extra turn, or pushes in front of others waiting for a turn.

* Promises or Bribes (Social)

This is recorded when the child offers material or psychological rewards to another for compliance with a request. The negative use of this strategy is to threaten someone else with material or psychological sanctions if a suggestion is refused.

Example of Promises or Bribes (Social)--Positive (+)

- The child offers: "I'll let you play with my car if you..." or "I'll be your friend if you..." or "I'll invite you to my birthday party if you..."

Example of Promises or Bribes (Social)--Negative (-)

- The child threatens: "I won't be your friend if you don't..." or "You can't come to my house if you..." or "I'm going to hit you if you don't..." or "You'll be sorry if you don't..."

NOTE: Compliance or noncompliance with bribes or threats is not recorded as a strategy.

* Helps (Social)

This is recorded when the child spontaneously helps or offers help to another child or adult, or responds positively to another's request for help. Usually this behavior appears to be an expression of friendliness, affection, or nurturance. If the observed child refuses a reasonable request for help from someone else, a negative is recorded.

Examples of Helps (Social)--Positive (+)

- The child notices that another child is having trouble lifting a large board and spontaneously offers help (verbally or nonverbally).

- The child notices that another child has spilled something and offers to help clean it up.

- The child offers to help another child who is having difficulty doing a mastery task.

- The child responds positively to a request for help.

Examples of Helps (Social)--Negative (-)

- The child refuses to help another child with a mastery task.

- Another child is carrying a heavy tray and a small piece of material has fallen off it. The observed child is asked to pick it up since it is near him/her but s/he refuses.

* Joint Effort or Combines Resources (Social)

This is recorded when the child suggests or initiates working together or joint use of material resources, or when the child complies with another's request to do so. When using this strategy, a child typically joins forces with someone else to achieve a goal or produce a product. The negative of this strategy is to refuse joint cooperative effort with someone else.

Examples of Joint Effort or Combines Resources (Social)--Positive (+)

- The child suggests: "Let's paint it together" (one large picture), or "Let's make the starship together."

- The child suggests combining effort to do a job: "We can both lift it together," or "We can both clean the turtle cage" (both had wanted to).

NOTE: Joint Effort is a strategy that typically continues over time, since children continue to work together for a period if the strategy is successful. The initiation of or initial compliance with the strategy is noted with the appropriate symbol (+ or A, R or I). (+) is recorded in each of the succeeding 15-second periods in which the children actually continue to work together, showing the continuation of the strategy. Younger children tend to sustain such joint efforts for briefer periods.

Example of Joint Effort or Combines Resources (Social)--Negative (-)

- The child refuses a reasonable suggestion by another that they build a garage together, or that they use the same box of beads to make necklaces.

Hostile Force (Social)

This is always a negative strategy because it is a resort to verbal or physical abuse in order to attain social goals or solve social problems. (Accidentally hurting someone else, physically or psychologically, is not included.) This category is recorded as A, R, or I since the negative is assumed. It includes using hitting, biting, grabbing, pushing, insults, taunts, etc., as ways of gaining social ends.

Examples of Hostile Force (Social)--Negative Only (-)

- The child teases and taunts another child who has refused to play with him/her.
- The child pushes another child out of the way to get a desired object.
- The child knocks over another child's block tower because the other had used blocks that the observed child wanted.

Resists Rules or the Teacher (Social)

This is a strategy indicating a lack of accommodation to the physical or social constraints of the setting. The observer should be familiar with the ground rules of the particular environment so it is clear when the child is violating a known rule. The rules are typically clear and explicit; for example: no throwing sand; cleaning up at the end of an activity; no running in the halls; being quiet when the teacher asks for silence; etc. Sometimes specific constraints are imposed by the teacher for a specific activity and these should be considered rules for that activity.

Examples of Resists Rules or the Teacher (Social)--Negative Only (-)

- The teacher reminds the child that children are supposed to wear aprons when they paint, but the child ignores her.
- The children have been called to circle time and all but the observed child are sitting in the circle. S/he has refused to come and is hovering moodily in a corner of the room.

- The children are supposed to be listening to the teacher's directions for the task that they are to do, but the observed child is whispering in the back of the room.

NOTE: Although the rules and demands of the teacher are not necessarily a model of justice in every classroom, it is important for a child to have strategies that help him/her get along in the classroom, so adjustment to these rules and demands is considered important.

Asks Social Help

This is recorded when the child asks help from a peer or the teacher to solve a social problem. The request must be initiated by the child being observed and is annotated for T (Teacher) or PM/PF (Peer).

Examples of Asks Social Help

- Another child has taken the observed child's toy or other object and the observed child asks the teacher to make the child give it back.

- The observed child asks the teacher's help because another child won't share, or "won't give me a turn," or "won't let me play."

NOTE: Asking for help is not given either a positive or negative value since it is not possible to determine reliably if a request for help is based on the competent use of available resources, or on a lack of independent strategies on the part of the child.

MASTERY STRATEGIES

Mastery strategies are categories with a (+) or a (-), where appropriate, depending upon whether they show effective or ineffective approaches to the task. More than one strategy may be entered in a single time slot if more than one occurs. When strategies continue over time, they are recorded in each 15-second period in which the strategy occurs.

MASTERY PLANNING STRATEGIES

Physical Setup (Mastery)

This is recorded when the child gives evidence of foreseeing the requirements of a task by preparing space for an activity, or by gathering together relevant materials before beginning the task, or by organizing materials (laying out, grouping) while doing a task. The negative of this strategy is recorded when the child fails to gather and/or organize materials in a task that requires this strategy, or gathers inappropriate materials.

Examples of Physical Setup (Mastery)--Positive (+)

- The child brings crayons and paper, or paper, paste, and scissors together before beginning a task requiring them, rather than having to interrupt the task to get forgotten but necessary materials. (The child may get a new idea requiring additional materials later in the task and still have organized well at the beginning.)
- The child anticipates the space needed to work on a task by how s/he begins the placement of blocks (Animal Stalls), puzzle pieces, etc.
- Before beginning, or during a task, the child lays out required materials in an organized way by putting matching blocks near each other or animals together (Animal Stalls); by turning puzzle pieces over; by putting materials within easy reach.

Examples of Physical Setup (Mastery)--Negative (-)

- The child has to keep getting up from the work area to get materials for a task which could have been foreseen earlier, keeps "remembering" new things s/he needs, or gathers materials haphazardly without reference to the model (Animal Stalls).

- The child has trouble keeping track of materials within a task, "losing" pencils, erasers, appropriate blocks or animals (Animal Stalls).

NOTE: A child without adequate Physical Setup strategies looks very disorganized when doing tasks.

Predicts Outcome or States Plan (Mastery)

This is recorded when the child makes a verbal prediction about, or states a plan for, a mastery activity.

Examples of Predicts Outcome or States Plan (Mastery)

- The child predicts that the seed s/he is planting will grow into a bean plant.

- The child comments: "I'm going to do the gates first" (Animal Stalls).

- The child predicts that s/he will soon finish his/her workbook.

Verbalizes Rules or Task Requirements (Mastery)

This is recorded when the child verbally indicates his/her understanding or what is required in a prospective or ongoing task. The child may repeat instructions to him/herself or others, may give verbal evidence of having a hypothesis about how to do the task, or may state general or specific rules that apply to a task.

Examples of Verbalizes Rules or Task Requirements (Mastery)

- The child repeats instructions to him/herself, such as: "We have to circle all the words that begin with T," or "We have to find the rhyming words," or "First I have to get some blocks" (Animal Stalls).

- The child gives verbal evidence of having a hypothesis about how to do the task by saying: "I've got to find the biggest one first" (seriation task), or "Every number will have a picture" (matching numbers to pictured objects), or "The little ones go on top" (stacking discs).

- The child states general or specific rules for tasks, such as: "You can't jump backwards until you are 'kinged'" (in Checkers), or "We have to finish each page before going on to the next" (workbook rule), or "No copying," or "We're not allowed to use pens for our printing."

* Uses Systematic Approach (Mastery)

This is recorded whenever the child gives evidence of the operation of a hypothesis or plan by proceeding in a systematic or ordered way, or by appearing to operate with a clear notion about what to do next and how to do it. The negative of this strategy is when the child seems to be floundering in a task with no clear ideas about how to proceed and is using a haphazard or trial-and-error approach. Uses Systematic Approach is a strategy which can continue over time as the child systematically follows his/her plan or approach to the task or continues a haphazard approach. When it is unclear to the observer whether or not the child is using a systematic approach, the category should not be marked.

Examples of Uses Systematic Approach (Mastery)--Positive (+)

- The child systematically does the edges of a puzzle before filling in the center or clearly uses color or shape to guide his/her choices of which puzzle pieces to try.
- The child builds in a coherent order starting with, for instance, the gates or the perimeter and proceeding section by section (Animal Stalls).
- The child lines up pieces in a matching task and systematically scans up and down the lines for a "match."

Examples of Uses Systematic Approach (Mastery)--Negative (-)

- The child has a seemingly haphazard approach to a puzzle task, picking up any piece without examination, trying pieces already tried in the same space, and using no discernible color, shape, or size cues.
- The child does the (Animal Stalls) task in a fragmented way, putting one gate in place, then getting a few animals, then beginning a separate stall.

NOTE: If the child is using a systematically wrong strategy, the observer should record (+) and note that it was wrong in the CONTEXT column.

MASTERY MONITORING STRATEGIES

Checks Instructions or Model (Mastery)

This is recorded when the child checks (looks back at, notices, searches) his/her own progress against expectations or plans, or against a model provided (e.g., Animal Stalls).

Examples of Checks Instructions or Model (Mastery)

- The child checks answers to simple math problems by using counters or rods.
- The child looks carefully over the shelf to find a particular block, or looks at the model s/he is copying to check progress or guide the next move (Animal Stalls).
- The child looks back to a model of what should be done at the top of a worksheet.

Describes or Comments on Work (Mastery)

This is recorded when the child verbally notices features of the task s/he is doing, or remarks on the progress of the task.

Examples of Describes or Comments on Work (Mastery)

- The child notices: "My puzzle is almost done," or "The top pieces are all small," or "I wrote all the numbers," or "The matching pieces have the same color on the back."
- The child notes as s/he is working (Animal Stalls): "All the animals have hay," or "The cow goes here," or "This gate is round," or "I am almost finished."

Comments on the Ease or Difficulty of a Task (Mastery)

This is recorded whenever the child indicates his/her perception of how easy or difficult the task will be, is, or was (if just over) for him/her (not for somebody else).

Examples of Comments on the Ease of Difficulty of the Task (Mastery)

- The child notes as s/he breezes through a task: "This is easy," or as s/he struggles with a task: "This is hard for me," or "This is too hard for me."
- The child says about a task suggested by the teacher: "That will be hard."

MASTERY ACCOMMODATING STRATEGIES

* Revises Action or Takes New Approach (Mastery)

This is recorded when the child notices that something has not worked out and changes his/her approach to the task or corrects errors. The negative of this strategy is entered if the child's revision is less effective, or if the change is from a correct response, action, or approach to an incorrect one.

Examples of Revises Action or Approach (Mastery)--Positive (+)

- The child is matching small pictures of faces. After putting several together, s/he notices that they are not exactly matched and corrects them.

- The child notices that something in his/her (Animal Stalls) construction does not match or is not in the right place (gates in wrong order, or animals in wrong stall), and corrects it.

- The child has been trying to use shape as the key in doing a puzzle, but notices that the shapes are all very similar and it is not working well. S/he switches to using color as the key and it works better.

Examples of Revises Action or Approach (Mastery)--Negative (-)

- The child has been underlining rhyming words correctly and is about half finished with the task. S/he suddenly switches from a strategy of saying the words aloud to check for rhyming to a strategy of selecting words that begin with the same letter. (Note that in this case both approaches are systematic and would be scored as a continuing positive Systematic Approach, but the new strategy would be accompanied by an annotation that it was incorrect. The switch would be scored as a negative Takes New Approach.

- The child has built part of the structure correctly (Animal Stalls) but takes it all apart to correct a minor mistake involving only one block.

- The child "corrects" a correctly placed block or animal making it wrong (Animal Stalls).

Fine Tunes (Mastery)

This is entered when the child carefully adjusts some part or aspect of a task. The child may align blocks more carefully, push together puzzle pieces that have come apart, or erase and rewrite written work.

Examples of Fine Tunes (Mastery)

- The child notices that all her/his printed numbers are not evenly spaced and erases some to correct this.
- The child straightens the gates so they line up evenly, or adjusts the animals or hay so that they are not touching (Animal Stalls).
- The child notices that his/her staircase of Cuisenaire rods is not perfectly straight and fixes it.

Asks Mastery Help

This is recorded when the child asks help from a peer or the teacher to solve a mastery problem. Again, the child must be the initiator of the request.

Example of Asks Mastery Help

- The child asks how a certain mastery task is to be done, or asks for help in the midst of a task because s/he is having trouble.

OUTCOME

COMPLETION CATEGORIES

Completes

This is recorded when the child clearly finishes or does all parts of a task, whether or not the parts are completed successfully. In the natural setting, if the child has not completed a task by the end of an observation, but has been working steadily up to that point, Completes is entered so it will not appear that the child failed to complete the task.

Incomplete

This is recorded whenever the child does not complete all parts of the task even if the parts done are all correct. In the natural setting, when the end of an observation cuts off the end of a task, the child is given the benefit of the doubt if s/he has been working steadily. If the child has often been distracted, the task should be entered as incomplete.

Not Applicable

This is recorded when for some reason the observer cannot determine whether or not the child has completed the task, either because of the nature of the task or the nature of the circumstances.

SUCCESS CATEGORIES

All Perfect

This is entered when there are no errors in the task upon completion. The child may have made errors while doing the task but all have been corrected.

Nearly Perfect

This is recorded when the child has done most of the task correctly and has clearly understood it.

About Half Right

This refers to any degree of correctness between Nearly Perfect and Less Than Half Right.

Less Than Half Right

This is recorded when more than half the parts of the task are incorrect.

NOTE: In the Animal Stalls task, a Completion Success Index is calculated by dividing the number of blocks, animals, and hay correctly placed by the total number of blocks, animals, and hay in the model. The degree of successful completion is therefore the proportion of items correctly placed, thus:

$$\text{Completion Success Index} = \frac{\text{N items placed correctly}}{\text{Total N items in model}}$$

A separate index for the basic block structure alone may also be calculated.

EVALUATION CATEGORIES

Praised

This is entered with a T (for Teacher) or PF/PM (for Peer) whenever the child is praised for any reason, whether solicited or unsolicited. It is usually clear from the INVOLVEMENT entries whether the child was praised for a mastery or a social activity. Notes in the CONTEXT section can make the reason explicit.

Criticized

This is recorded with a T (for Teacher) or PF/PM (for Peer) whenever the child is criticized by another for any reason, whether solicited or unsolicited. Again, it is usually clear from the INVOLVEMENT entries whether the child was criticized for a mastery or a social activity or for not being engaged, and notes in the CONTEXT section can make this explicit.

Corrected

This is entered with a T or PF/PM (as above) whenever the child is corrected for any reason. The INVOLVEMENT entries should clarify whether the child was corrected for a mastery or a social activity, and notes in the CONTEXT section can make it explicit.

Ignored

This is entered when the child's attempts to get a response from the teacher or peers are ignored. The INVOLVEMENT marks should clarify whether the child was ignored in a social or mastery context, but notes in the CONTEXT section can make this explicit.

CHILDREN'S STRATEGIES ASSESSMENT SYSTEM (CSAS)

Child:	INVOLVEMENT										SOCIAL STRATEGIES																								MASTERY STRATEGIES												OUTCOME															
Age/Grade:	Social			Mastery					Other		Plans								Monitors			Accommodates												Plans							Monitors				Accom.				Completes												Evaluation			
Sex:											+/- A/R/I											+/- A/R/I												+/-											+/-																T/P			
Ethnicity:	Collaborative	Non-Collaborative	Socializing	On Task	Explores	Distracted	Attends Instruction	Involved Watching	Not Involved	Other	*Physical Setup	Predicts Outcome	Suggests/Dem/Dir.	Assigns Roles/Res.	Invokes Rules	*Requests to Join	Monitors Others	Descr./Comm. Others	Descr./Comm. Self	*Shares	*Trades/Trades Off	*Takes Turns	*Promises/Bribes	*Helps	*Joint Eff./Comb.Res	Hostile Force	Resists Rules/T	Asks Soc. Help T/P	*Physical Setup	Predicts Outcome	Verb. Rules/Requir.	*Uses System. Appr.	Checks Instr./Model	Descr./Comm./Work	Descr. Ease/Diff.	*Revises/New Appr.	Fine Tunes	Asks Mast. Help T/P	Complete	Incomplete	Not Applicable	All Perfect	Nearly Perfect	About Half Right	Less Than Half Right	Not Applicable	Praised	Criticized	Corrected	Ignored
School:																																																												
Teacher:																																																											
Setting:																																																											
Observer:																																																											
Date:																																																											
Time:																																																											
Obs. #:																																																											
Page #:																																																											

APPENDIX B

Parent Packet,

School and Head Start Information Sheets

Reduced

BANK STREET COLLEGE OF EDUCATION

610 WEST 112TH STREET
NEW YORK, N.Y. 10025
PHONE: (212) 663-7200

November 1981

Dear Parent:

Your Head Start center or school has agreed to cooperate with us in a project that is designed to find ways of measuring how effective Head Start programs are for children. We are writing to ask you to cooperate in the project.

The Administration for Children, Youth and Families (ACYF) of the United States Government funds all Head Start programs. For the past several years, ACYF has held discussions and workshops across the country with Head Start parents and teachers, with elementary school teachers and with experts in child development and education about the ways that Head Start is expected to help children. As a result, new measures are now being developed that are relevant and responsive to Head Start and the diverse populations it serves, and that help give a better picture of how Head Start helps children to be more competent in school and in their everyday lives.

Our organization, Bank Street College of Education, is one of four organizations that has a contract with ACYF to develop some of these new measures. We are developing measures of children's strategies--how children organize what they do in purposeful ways. These measures will be used with children aged three and four who are in Head Start programs, and with children five, six and seven years old who are Head Start graduates in public primary schools.

To try out our measures, we will be observing children in Head Start and primary school classrooms. Some children will also be taken out of their classrooms to another room in the center or school to do some tasks, for example, building with blocks or matching objects. The tasks we are presently considering are described in the attached page.

Please complete the Parent Consent Form below, detach it and send it back to your Head Start Center or school as soon as possible. Thank you very much.

Yours sincerely,

Doris Wallace

Doris B. Wallace, Director
Applied Strategies Project
Head Start Measures Development

. . . . . .

PARENT CONSENT FORM

☐ YES. I am willing to help in this project and give consent for my child _____ (child's name) to be interviewed.

☐ NO. I do not wish my child _____ (child's name) to be interviewed.

_____
(signature)

_____
(relationship to child)

_____
(date)

BANK STREET COLLEGE OF EDUCATION

610 WEST 112TH STREET
NEW YORK, N.Y. 10025
PHONE: (212) 663-7200

Head Start Measures of Children's Strategies: Overview

The aim of this project is to develop measures of children's strategies, that is, how they organize what they can do in purposeful ways. We plan to observe children in their classroom and also to ask some of them to do some tasks in a separate room for about 20 to 30 minutes. We will ask two children at a time to come with an interviewer. The activities they will be asked to do will be interesting for them and will be suited to the children's age.

We are in the process of developing these tasks, so they may be changed depending on how the children respond. We will be asking children to do one or more of the following tasks:

Construction Tasks

The child will be shown a simple model construction and asked to make a copy of the model. The materials will be small blocks of different shapes and colors and miniature animals.

Pretend Stories

The child will be asked to talk about what might happen in a variety of pretend (make believe) situations that can happen in everyday life in school. Each child will be shown a picture and asked to tell about it. For example,

> "here is a picture of a boy who is doing some work in school and he gets stuck. He doesn't know what to do next. What could he do?"

Number Board

The child is given a number board and a series of jars. Each jar contains ten numbered tiles and is labeled. For example, the jar containing tiles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 is labeled 1-10. The task requires that the child place each numbered tile in the correct space on the number board. A model with the numbers filled in is also provided. Younger children will be given a smaller set of numbers, up to 20; older children may be given up to 50. The children can count, or match what they do to the model.

Object Match

The child will be asked to match objects in columns or rows from a model. This task is similar to the number board but uses objects rather than numbers. The child will be shown a display in which objects are arranged in rows or columns, or both for the older children. The objects will have magnetic backs. The board is magnetized so that the objects can be moved but will stay in place on the board.

Reduced

BANK STREET COLLEGE OF EDUCATION

610 WEST 112TH STREET
NEW YORK, N. Y. 10025
PHONE: (212) 663-7200

Noviembre 1981

Queridos Padres:

La escuela o centro de Head Start adonde asiste su hijo(a) ha consentido en cooperar con nosotras en un estudio que tiene como propósito buscar maneras de evaluar la eficacia de los programas que ofrece Head Start a los niños. Escribimos esta carta para pedir su ayuda y cooperación en este estudio.

Por varios años la oficina del gobierno federal conocida por el nombre de "Administration for Children, Youth and Families" (A.C.Y.F.)y encargada del manejo de los fondos de Head Start ha estado organizando nacionalmente, talleres (workshops) en donde padres y maestros de Head Start, maestros de escuelas públicas y expertos en los campos de educación y desarrollo de niños, han estado discutiendo los proyectados beneficios de Head Start. Como consecuencia, se están desarrollando nuevas medidas que no sólo se ajusten y sean más sensibles a las realidades de Head Start y a sus diversas poblaciones, sino que tambien rindan información más adecuada en cuanto a como ayuda Head Start a que los niños en sus programas sean más competentes en la escuela y en la vida diaria.

Bank Street College of Education, es una de cuatro organizaciones contratadas por (A.C.Y.F.) para desarrollar parte de estas nuevas medidas. Nosotras estamos encargadas del desarrollo de métodos que puedan captar y medir las estrategias o sea la manera en que organizan los niños sus actividades para el cumplimiento de algun fin. Estas medidas serán utilizadas en Head Start con niños entre 3 y 4 años de edad y con niños de cinco, seis y siete años de edad que han asistido a Head Start y están presentemente en escuelas públicas.

Para poder completar el desarrollo de estas medidas necesitamos poder probarlas. Esto requiere el uso de observaciones de niños en clases de Head Start así como también en escuelas públicas. Se hará necesario que algunos niños nos acompañen fuera del salón de clases pero dentro del mismo centro o de la misma escuela, a un lugar mas callado o para no molestar a los demás niños en el salón de clase, donde les daremos tareas como por ejemplo, construir con bloques o comparar objetos. Las tareas que estamos considerando están descritas en la página adjunta.

Por favor completa el formulario que aparece debajo lo mas pronto posible, dando su permiso para que su hijo o hija participe en este estudio.

Le agradecemos muchísimo su cooperación.

Atentamente,

Doris Wallace

Doris B. Wallace, Directora
Projecto de Medidas de Estrategias
Medidas de Desarrollo Head Start

. . . . . .

FORMULARIO DE PERMISO

11

☐ Si. Yo quiero cooperar con este proyecto y doy mi permiso para que mi hijo(a) _____ sea entrevistado(a).
Nombre del niño(a)

☐ No. No quiero que mi hijo(a) _____ sea entrevistado(a).
Nombre del niño(a)

_____
Firma del padre o persona encargada.

_____
Parentesco con niño(a)

_____
Fecha

BANK STREET COLLEGE OF EDUCATION

610 WEST 112TH STREET
NEW YORK, N.Y. 10025
PHONE: (212) 663-7200

Resumen de Medidas

El propósito de este proyecto es el desarrallo de medidas que puedan captar las estrategias o sea la manera en que organizan los niños sus actividades para el cumplimiento de algún fin. Estaremos observando niños en sus clases y también observaremos unos cuantos niños por unos 20 a 30 minutos fuara del salón de clase pero dentro del mismo centro o de la misma escuala, donde les daremos tareas que hacer. Los niños encontrarán estas tareas agradables e interesantes y éstas serán adecuadas para su edad.

Como estamos todaviá experimentando tratando de decidir cuales tareas usaremos, éstas pueden cambiar dependiendo de las reacciones de los niños.

A continuación describimos las tareas que serán ensayadas. Se pedirá a cada niño que haga una o más de estas tareas:

Tareas de Construcción

Se le mostrará al niño un modelo sencillo y se le pedirá que construya una copia de este modelo. Los materiales que se usaran son pequaños bloques en diferentes formas y colores.

Situaciones Fingidas

Se le dirá al niño que hable acerca de lo que podriá sucedar en una variedad de situaciones fingidas pero que podrián sucedar. Se le mostrara al niño una fotografiá y se le pedirá que responda a la situación. Por ejemplo, "esta es una fotografia de un nino que está haciendo un trabajo o una tarea en la escuala y no puede avangar por que encuentra que no puede resolver un problema que se le presenta. El niño no sabe que hacen. Que podria hacer el niño?"

Pizarra de Números

Se le dará al niño una pizarra y una serie de frascos. Cada frasco tiene una etiqueta con los números contenidos en ese frasco. Cada frasco contiene 10 piezas y sobre cada pieza hay marcado un número. Por ejemplo. El frasco que contiene las piezas 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 tiene en frente una etiqueta inscritá 1-10 y dentro de este frasco cada pieza tiene un número escrito de 1 a 10. La tarea será que el niño coloque cada pieza sobre el espacio de la pizarra que le corresponda. Se le dará al niño un models para que lo use como guiá. A los niños manores se les pedirá que llenen los espacios sobre la pizarra hasta 20; a los mayores se les pedirá que lleguan hasta 50. Los niños podrán ya sea contar o guiarse del modelo.

Comparación de Objetos

Se le pedirá al niño que busque los pares de los objetos que aparecen en las filas o columnas de un models que será suministrado. Esta tarea es similar a la pizarra de números excepto que ésta usa objetos en vez de números. Se mostrará al niño un models en el cual los objetos están acomodados en filas o en columnas. Para los niños majores los objetos estarán acomodados en filas y en columnas. Los objetos tendrán magnéticos al revés. La pizarra será magnetizada para que los objetos puedau ser movidos de un lugar a atro y al mismo tiempo puedan permanecer pegados sobre la pizarra.

HEAD START CENTER INFORMATION SHEET

NAME OF CENTER: _____

ADDRESS: _____

_____

TEL. NO: ( ) _____

DIRECTOR: _____

ASSISTANT DIRECTOR: _____

EDUCATIONAL COORDINATOR: _____

AGE OF CHILDREN	CENTER		HOME BASED
	NO. CLASSES	NO. CHILDREN	NO. CHILDREN
3			
4			
5			

Information given by: _____ Date: _____

HEAD START CLASS LIST

NAME OF H.S. CENTER _____ AGE OF CHILDREN _____

TEACHER _____ AM _____

ASSISTANT OR CO-TEACHER _____ PM _____

AIDE _____

CHILD'S NAME	SEX M/F	D O B D/M/Y	ETHNICITY B	C	A	H	LANG DOM	ENTRY DATE	OTHER PRE SCHOOL	OTHER

Key

D O B = date of birth (day/month/year)

ETHNICITY = B=Black H=Hispanic (please indicate area of origin if known e.g., C=Caribbean, PR=Puerto Rican, SA=South American)
C=Chinese
A=Anglo

LANG DOM = language dominance (language child prefers)

ENTRY DATE = into this center (month/year)

OTHER PRESCHOOL EXPERIENCE = if known (yes, no, don't know)

OTHER = please indicate any severe handicapping conditions or other unusual circumstances.

Information given by _____

For Bank Street College
Head Start Measures Development Project

Date _____

Bank Street College of Education
Head Start Measures Development Project

PRIMARY SCHOOL INFORMATION SHEET

NAME OF SCHOOL _____

ADDRESS _____

_____

TEL. NO. ( ) _____

PRINCIPAL _____

ASSISTANT PRINCIPAL _____

Grades	# Classes	# Children	AM	PM	Classroom Teacher
Kindergarten	1				
	2				
	3				
	4				
First	1				
	2				
	3				
	4				
Second	1				
	2				
	3				
	4				

Information given by _____ Date _____

11/81

PRIMARY SCHOOL CLASS LIST

NAME OF SCHOOL _____ GRADE _____

TEACHER _____ CLASS # _____

ASSISTANT OR CO-TEACHER _____ AM _____

OTHER TEACHING STAFF _____ PM _____

CHILD'S NAME	SEX M/F	D O B D/M/Y	ETHNICITY B	C	P	H	LANG DOM	ENTRY DATE	HS EXP Y/N/DK	OTHER

Key

D O B = date of birth (day/month/year)

ETHNICITY = B=Black H=Hispanic (please indicate area of origin if known e.g., C=Caribbean, PR=Puerto Rican, SA=South American)
C=Chinese
A=Anglo

LANG DOM = language dominance (language child prefers)

ENTRY DATE = into this school (month/year)

H.S.Exp=was child in Head Start before entering primary school? (yes, no, don't know)

OTHER = please indicate any severe handicapping conditions or other unusual circumstances.

Information given by _____

For Bank Street College

Head Start Measures Development Project

Date _____

APPENDIX C

Teacher Rating Form

School_____ Child _____

Date_____ Teacher_____

Interviewer_____ Class_____

Teacher Rating Form

We want to ask you a few questions about the children we have been seeing.

First of all, are the children in this class/center used to having visitors?

___very often (weekly) ___occasionally (1/month) ___seldom have visitors

I'd like to ask some questions about_____. Is he/she a child who:

1. gets along well with other children? ___very well ___average ___not too well
2. enjoys school? ___very much ___average ___not much
3. likes to try new things/activities? ___yes ___sometimes ___not at all

   (what preferred/not preferred_____)
4. is generally cooperative with other children? ___yes ___sometimes ___not very
5. is generally cooperative with you, the teacher? ___yes ___sometimes ___not very
6. is a leader in the child group? ___yes ___sometimes ___hardly ever
7. keeps at something or is likely to give up if he/she is having difficulty?

   ___persists ___mixed ___gives up
8. can shift gears when circumstances change (e.g., is flexible, takes another approach to a problem)? ___mostly yes ___sometimes ___mostly no
9. is likely to plan and think ahead, or acts more on the spur of the moment?

   ___plan ahead ___spur of the moment
10. is likely to finish what she/he starts? ___mostly yes ___sometimes ___mostly no
11. is easily distracted? ___yes ___no

12. In general, would you say that (this child) feels pretty good about her/himself?

    ___yes ___mixed ___no, poor self-image

13. How would you judge this child's general competence?
    a) in school-related tasks ___high ___average ___low for his/her age
    b) in social interaction ___high ___average ___low for his/her age